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EDITORIAL.

SERUM THERAPY BY MOUTH.

It is interesting, consoling, at the same time amusing in these days of hypodermic and intravenous medication to note an instance of reactionary tendency and one not devoid of practical utility.

We refer to the administration by mouth of antidiphtheritic serum both as a therapeutic and a prophylactic measure. This is reported by Dr. Leon Dufour, in the *Archives Médicales de Normandie*, who has been using the method for the last twenty years. He first tried it in the case of a very ill child, in a rural community, whose parents flatly refused to permit the injection of the serum. He administered 4 doses of serum (10 cc. each), fifteen minutes apart, in a little aromatized water. The child made a quick recovery. Encouraged thereby he continued the practice, resorting to one dose as a prophylactic with equal success. He was always ready to intervene otherwise, that is by needle, if circumstances demanded it, but has never found this intervention necessary. While he is fully aware of the theoretical objection to the method, namely the inaction of the serum in the presence of the gastric juices,

he points in answer to the results obtained, the cure of the patients. As with the serum given by needle, the effects are prompt and satisfactory in proportion to the early exhibition and the size of the doses

A remarkable detail in favor of the administration by mouth is the total absence of anaphylactic reactions whatsoever.

In presenting the above facts it is not our purpose, we need scarcely add, to recommend the substitution of the buccal route for the subcutaneous as intravenous in the administration of antidiphtheritic serum, but it is good to know that such a method may be used with satisfaction if untoward circumstances or the fear of anaphylaxis interferes with the ordinary routine.

MONUMENT TO FINLAY.

We present a picture of the monument which was recently unveiled and is placed in the centre of Finlay Park at Havana, Cuba. It is in commemoration of Dr. Carlos Finlay y de Barres, who is well-known by his discovery of the transmission of yellow fever by the stegomyia callopus, leading to the demonstration by the United States Army Medical Commission and the developments which mean that yellow fever is now easily controlled and will in all probability be eradicated from the face of the earth before long.

The main feature of the monument is a statue of Dr. Finlay which, we are told is quite life-like. In the same park is also placed, in one corner, a bust of Lazear, the martyr yellow fever worker; three other busts are in the course of preparation for the other corners of the park, those of our Wm. C. Gorgas, of Juan Guiteras and C. Delgado, of Havana.

Dr. Finlay was born at Camaguey, Cuba, on December 3, 1883 and died in Havana on August 20, 1915.

We are indebted to Professor W. H. Hoffman, of Las Animas Hospital, Havana, for the photograph from which the cut of the monument was made.

HEMOGLOBINURIA.

In this issue we publish a paper by an esteemed and venerable member of our profession, Dr. F. M. Thornhill, of Arcadia, on what he terms "Malarial Hemoglobinuria." This is one of the papers from the pen of an "unforgotten worthy" we had solicited from some of our past masters in various lines, a few of which have already been published, with more to come.

This paper was written eighteen years ago and then covered an experience of over thirty years, so that it shows the view point on the subject beginning practically half a century before the present time.

The author fully realizes that the scientific status of this subject and of malaria has changed and has greatly broadened, yet believes that the paper may nevertheless be useful in calling attention to the difference of opinion held formerly and now. We think the article serves the purpose admirably and can not agree with the writer in the opinion he modestly expresses that it has no scientific value. Facts are facts and their careful observation and honest recordation are of the highest importance in the solution of any problem and the settling of any scientific proposition. We are sure the paper will be read with the greatest interest as a valuable reminiscence and an important historic contribution.

ORIGINAL ARTICLES.

(No paper published or to be published in any other medical journal will be accepted for this department. All papers must be in the hands of the Editors on the tenth day of the month preceding that in which they are expected to appear. Reprints may be had at reasonable rates if a WRITTEN order for the same accompany the paper.)

MALARIAL HEMOGLOBINURIA.*

By F. M. THORNHILL, M. D., Arcadia, La.

Malarial Hemoglobinuria as the name implies is supposed to be due to chronic or to intense malarial infection and is characterized by the appearance of the coloring matter of the blood (Hemoglobin) in the urine, imparting to it the color of port wine or poke berry juice of a deeper or paler hue according to the amount of coloring matter present. It is a disputed point among clinical observers as to whether the discoloration of the urine is due to the presence of hemoglobin alone or to the constituents of the blood as a whole. The microscope discloses the presence of red blood corpuscles in but few cases and their entire absence in the majority of others. So it would appear that in the greater number of cases, the discoloration is what the term implies, a true hemoglobinuria. The literature of this form of malarial fever is limited and meager, no extended account of the disease is contained in any of the text books of the past or present time and for our knowledge of the subject we have been dependent upon a few desultory and conflicting articles appearing in the medical journals from time to time. It has long been believed that this disease was of malarial origin and that the hemoglobinuria was due to blood changes resulting from chronic malarial cachexia or to an infection of more than ordinary virulency producing a hemorrhagic tendency, notwithstanding the well known fact that malaria primarily is not a hemorrhage producing disease. The nomenclature of hemoglobinuria has been derived more from the variations in its clinical manifestations in different localities than from any definite conception of its true etiology or pathology and it is known by different names in different parts of the world. Malarial Hematuria, Malarial Hemorrhagic fever, Climatic fever, Rice fever, Swamp fever, Black Jaundice, etc., are some of the names by which the disease is known in our own and other

*Read before the Bienville Parish Medical Society, Arcadia, July, 1903.

countries and our best authorities agree in the opinion that the black water fever of Africa has its clinical counterpart in this form of malarial fever.

The etiology of this disease is a subject on which there has been wide divergence of opinion among physicians but the preponderance seems to be in favor of malaria.

Against this theory is the interesting fact that few cases of malaria, comparatively speaking, assume the clinical features of this form of the disease and the further well established scientific fact that malaria never induces a hemorrhagic tendency as a primary effect, or else we should have hemoglobinuria occurring much oftener than seems to be the case from clinical observation. But, notwithstanding these apparently irreconciliable facts, there is a well grounded belief in the minds of most physicians that malaria is in some way concerned in the production of hemoglobinuria. Some have suggested that it is due to a specific form of the malarial parasite but scientific researeh has failed to discover such special micro-organism. A strong circumstance in favor of the malarial origin of hemoglobinuria is the frequency with which it occurs in malarial sections, coupled with a history of previous attacks of malaria in the majority of cases while it seems never to originate in non-malarious localities. The conclusion has been reached by some good authorities, appointed to investigate the subject, that the disease is of malarial origin but cannot be considered as possessing the characteristic features of a malarial attack.

The pathology of the disease is obscure and as yet not determined and various theories have been advanced to explain the cause and the source of the hemorrhage. Dr. S. M. Bemiss, who wrote the chapter on malarial fever in Pepper's System of Medicine and who at that time was more conversant with the clinical manifestations of malaria than almost any other man, was decidely of the opinion that the disease was of malarial origin and classed it as one of the pernicious forms of malaria. At that time Laveran had not discovered the plasmodium, or at least had not promulgated it, and the role of the mosquito in the propagation and the spread of malaria had not been dreamed of nor had Patrick Manson Jr. offered himself on the altar of science to determine this fact. Dr. Bemiss suggested three

probable factors as being more or less concerned in the production of the hemorrhage, each of which contains sound reasoning. First he considered the blood changes incident to chronic malaria as so altering the consistency of that fluid as to favor hemorrhage. Second, that the malnutrition and textural changes resulting from the same so weakened the walls of the blood vessels as to increase their liability to rupture. Third, the increased blood pressure and passive congestion incident to the attack.

Malarial hemoglobinuria is also attended with jaundice, the association of which with the bloody urine constitutes the outstanding clinical feature of the disease. The cause of the jaundice has evoked almost as much discussion and controversy as the course and cause of this hemorrhage. The bloody urine and jaundice do not occur simultaneously, the former usually makes its appearance early in the cold stage of the attack followed by the latter a few hours. The suddenness with which the jaundice occurs suggests the operation of some powerful systemic toxic agent. Some have endeavored to explain its occurrence on the score of obstruction to the assimilation of bile and its constituents, while others ascribe it to excessive secretion. Dr. Bemiss accounted for it by what he called lack of consumption. He thought the addition of toxic agents, such as urea and its compounds, to the already profoundly poisoned blood suddenly arrests the physiological processes by which the bile is disposed of. Bloody urine, jaundice, nausea, vomiting, insatiable thirst, suppression of urine, sometimes complete, delirium, jactitation etc. make up the clinical picture of the typical case of malarial hemoglobinuria and when seen a few times is not easily forgotten. The attack often is very sudden and violent and not infrequently terminates fatally in a surprisingly short time.

At Columbia, on the Ouachita river, where the first ten years of my professional experience was acquired, I saw a great deal of this disease in its most typical and malignant form and a brief report of two cases that came under my observation will serve to show the suddenness of the attack and the rapidity with which it sometimes terminates in death.

Late one afternoon in October, 1872, a lawyer, about 35 years of age, residing on his plantation on the Ouachita river, four miles above Columbia, came into my office and told me he felt that he was on the verge of an attack of swamp fever and asked me to

prepare him a certain laxative mixture he had previously taken, which he hoped might ward it off. He was a man of a high order of intelligence and had had one or two attacks before and was familiar with the clinical features of the disease and the manner of its approach. I prepared the mixture he called for and he went immediately to the ferry, crossed the river and proceeded to his home and was seized with a severe chill soon after arriving there. An hour or two later a messenger came for me to go to see him. I reached his bedside about 11 o'clock that night and found him in a stupor with the clinical picture of hemoglobinuria fully developed. The extremities were cold, the pulse at the wrist absent, the entire body was bathed in a deeply colored perspiration and it seemed to be literally an example of sweating of blood. Jaundice was profound, large quantity of dark colored urine was voided involuntarily for a few hours, when the kidneys ceased to act, the stupor deepened and death closed the scene, in about eighteen hours from the time he came to my office.

The history of the second case is very similar in every respect to the one just related and I will not detain the society to give details further than to say that the patient was a white man about fifty years of age apparently in good health but had a history of previous attacks. The attack was equally sudden as in the case of the first patient and terminated fatally in about the same length of time. After the lapse of more than thirty years, the picture of these two cases remains vividly in my mind. At that time perhaps considerably less was known of the etiology and the true pathology of the disease than now and I believe a great deal yet remains to be learned. Opinions differ as widely concerning the treatment of hemoglobinuria as to its etiology and pathology, one of the chief differences being with regard to the use of quinine. There seems to be a growing belief in some sections that there is a certain causal relation between quinine and hemoglobinuria. Some good physicians contend that in some persons and in certain conditions the drug will produce the disease, but what those conditions are has not been determined.

The aid of experimental therapeutics has been invoked to determine the question and not long ago Ross and Law reported in the *British Medical Journal* some interesting experiments bearing on the subject. A patient recently returned from Africa who had had a number of attacks, volunteered to demonstrate in the presence of the students of the London School of Tropical Medicine the fact that quinine would produce hemoglobinuria in his own person. In October 1902, believing this patient had an attack of malaria, he was given 10 grains of quinine at 5 p. m. and at midnight he had a rigor and developed typical hemoglobinuria which lasted several days. On

March 11, feeling chilly and feverish he was again given ten grains of quinine at 7 p. m. and at midnight developed hemoglobinuria and in a few days was apparently well. On March 23, Dr. Manson, a member of the faculty of the London School of Tropical Medecine gave him 10 grains at 9 p. m. and at 11 a. m. he had a rigor followed by nausea, vomiting, bloody urine and jaundice, thus proving conclusively that in this patient at least quinine would and did produce hemoglobinuria.

On the Ouachita river, where, as before stated, I saw a great deal of this disease, there was a deeply rooted belief among the laity that quinine would produce the disease; with some it amounted to a morbid fear and the knowledge that they were taking the drug during an attack added greatly to the gravity of the prognosis. I have seen a number of cases myself in which the attack developed soon after taking large quantities of quinine and at the time when the patients were profoundly under its influence. I recall two such cases occurring in Arcadia in recent years, one of whom was my own wife. She had had fever of a remittent type for several days which, owing to the healthy surroundings and apparent absence of causes for malaria, I was loath to believe of malarial etiology but, nevertheless, I had given her large quantities of quinine and while profoundly under its influence, she developed hemoglobinuria. She had a rigor while in this condition followed by nausea and vomiting, bloody urine and intense jaundice. The eyes, skin, soft palate and roof of the mouth were deeply jaundiced and she said all objects presented a deeply jaundiced hue. I discontinued the quinine and in two or three days the urine cleared up and all other symptoms disappeared except jaundice which lingered several days. She made a good recovery and has not had a recurrence of the disease up to this time. About two years ago a lad from Texas, fifteen or sixteen years old, while on a visit to relatives in Arcadia, had an attack of what I considered estivo-autumnal malarial fever. His liver and spleen were very much enlarged and there was a history of previous attacks of malaria and of one attack of hemoglobinuria. On the second or third day of his illness, during which time I had given him large amounts of quinine and when the physiological effects of the drug were marked and profound he developed hemoglobinuria. Bloody urine, jaundice, nausea and vomiting rapidly ensued and in a few hours the clinical picture

of the disease was fully developed. I discontinued the quinine and in about forty eight hour all symptoms of the disease had disappeared, save jaundice and the lad safely recovered.

Lest I forget, I want to say here that I have never seen a case of malarial hemoglobinuria in a person who did not give a history of previous attacks of malaria or was profoundly under the influence of quinine at the time of the attack. The disease in the vast majority of cases is a fever of one paroxysm whether quinine be administered or not and seldom assumes the intermittent type and either ends in recovery or terminates in death in a few days. In an experience of more than thirty years, I have never seen but one case of the intermittent type. If, as has been suggested, altered blood conditions, tissue changes and increased blood pressure are factors in the production of hemorrhage it requires no stretch of the imagination to enable us to understand how quinine added to the already profoundly toxic condition might increase both the hemorrhage and the toxemia. The attack sometimes occurs almost with the abruptness of an explosion and is probably due to the sudden liberation of a large number of dead parasites into the blood stream and the rapid diffusion of their toxins into the system, and if this theory be correct, manifestly the gravity of the condition would be greatly increased by giving quinine at this juncture. Experience has taught me not to give quinine until after the urine has cleared up and not then unless the fever continues. Usually the fever gives way in two or three days after the urine becomes clear. In cases in which the fever continues beyond this time there are probably enough living parasites remaining in the blood to perpetuate the fever and in that event we may venture to give quinine with safety and even with benefit. It may appear paradoxical to admit that hemoglobinuria is a malarial disease but that quinine is not the remedy with which to cure it but such is, I believe the case. It seems to me that hemoglobinuria is an end result, or sequela if you prefer, of chronic malarial infection and probably a new toxin is elaborated and brought into play practically changing the pathology of the disease and at the same time requiring a change of therapeutics. At any rate, experience has convinced me that quinine is not the dependable drug in the treatment of hemoglobinuria it is in the ordinary forms of malaria. Other drugs are of far more value.

The prime indications of treatment are to maintain the renal functions and other avenues of elimination and to sustain the action of the heart. Renal and cardiac failure constitute the chief source of danger and in the majority of cases are the immediate cause of death. To promote general elimination, nothing is superior to small doses of calomel given at varying intervals according to the needs of each individual case. If there is constipation in the beginning of the attack, the treatment should be inaugurated by giving a brisk mercurial purge followed by smaller doses if deemed advisable. Calomel meets a number of leading indications. It more nearly influences favorably all of the emunctories than any other drug. In fact, it reaches out and influences directly or indirectly all the organs usually classed as emunctories, with the possible exception of the lungs and in this way fulfills an important indication in the treatment of hemoglobinuria. Opinions differ as to the best means of maintaining the renal functions. Some advise the use of diuretics while others earnestly oppose them. Those who argue against them, contend that the kidneys are already in a state of inflammation and exhaustion and need rest and should not be goaded by giving diuretics. If we were dealing with a true nephritis this would be considered sound reasoning, but instead there is good reason to believe that the pathology of the kidney is one of simple stasis or passive congestion with blocking of the uriniferous tubules in some cases from mucous coagula or other debris and I do not hesitate to register myself on the side of diuretics of the proper kind. To my mind, diuretics of a non irritating class are clearly indicated in order to flush the kidneys and maintain the flow of urine. Water, natures diuretic, the most valuable of all, should be given as freely as the patient can and will take it. At the head of the diuretic drugs stands digitalis. In the form of the fresh infusion it is the most reliable of all diuretic drugs while at the same time, it is the very best of heart stimulants, which becomes imperative in most cases at some time during the course of the disease. I am in the habit of combining with each dose of digitalis ten grains of potassium citrate and fifteen or twenty drops of spirits of nitrous ether in a sufficient amount of water which makes an admirable diuretic and diaphoretic mixture, meeting another important indication by its actions on the skin. If the fever maintains a high degree, I sometimes add one or

two drops tincture aconite to the above mixture, which makes an efficient antipyretic without the depressing effect of the coal tar derivatives and other latter-day antipyretics. The ice cap and tepid or cold sponging, according to the degree of temperature, skillfully applied are valuable adjuvants. I have seen the flow of urine gradually return under this treatment so many times after having been suppressed for twenty-four or forty-eight hours that there is no doubt in my mind of its efficacy and I have as often seen digitalis supplemented with a little strychnine sustain and restore a weak and failing heart. Nausea and vomiting are obstinate features in many cases of hemoglobinuria and stand very much in the way of successful and satisfactory treatment and the relief of this troublesome feature is often very difficult and such things as cracked ice, sipping of hot water, oxalate of cerium, champagne and the like have been employed with very indifferent success. Finally, as a dernier resort, morphine may have to be employed hypodermically and sometimes affords prompt and permanent relief and in other ways seems to do the patient good. In the desperation born of despair in the management of intractable cases, I have sometimes been tempted to resort to stomach washes but owing to the usually extreme weak condition of the patient have not had the courage to undertake it. The treatment I have outlined, if faithfully and intelligently followed with the proper adjustment of nourishment and support, will, I feel sure insure the greatest number of recoveries in hemoglobinuria. The fact that suppression of urine with its resultant toxic effect constitutes one of the chief sources of danger should not be lost sight of and the kidneys should be carefully watched from the beginning and every legitimate means employed to maintain their function, for it is easier to maintain the flow of urine than it is to re-establish it after it has failed. I have never seen the flow of urine restored after it had been suppressed as long as forty-eight hours, although, I have seen patients live a number of days beyond that time with the bladder perfectly dry. I remember one instance in which the patient lived eight or ten days without passing a drop of urine. Less than two years ago I saw a case in consultation with my friend Dr. Hamner, in which the patient lived four or five days with complete suppression of urine.

In conclusion I want to utter a word of caution with regard to the use of diuretics. In advising this class of drugs, you will remember I said diuretics of the proper kind, implying that there are some improper ones. I had reference to stimulating and irritating diuretics such as are capable of inducing inflammation and of producing a real nephritis of which turpentine is possibly the best example. In our eagerness to maintain the renal functions this class of diuretics should be strenuously avoided.

INFECTION WITH THE FLAGELLATES.

By ELLIOTT C. PRENTISS, M. S., M. D., El Paso, Texas.

In the Southwest patients harboring the trichomona intestinalis and other flagellates are very frequently seen, in fact, forming a considerable percentage of all patients seen by a physician limiting his practice to gastro-intestinal work. In the last 112 private patients seen by me, and whose feces were examined microscopically, 12 or 10.7% had this infection. In many of these cases the pathological conditions present could have been accounted for by this parasite. These 112 cases represent the average run of patients seen by me during a period of 12 years in El Paso. Nearly all the cases acquired the infection in western Texas, New Mexico, Arizona, and Mexico, but there were a few from the Southern States. It is probable that these infections become more common as we go south.

There has been doubt in the minds of many medical men regarding the pathogenicity of the flagellates. Probably many persons harbor these organisms and never have symptoms resulting from them. Also many persons upon examination will show this infection, without it being related to the cause of the trouble, but I have seen a number of cases in which the symptoms could not be accounted for in any other way, and treatment directed against these organisms would as a rule quickly relieve the patient of symptoms which would not return until the organisms again became very numerous. This parasite certainly can, under conditions which we do not as yet fully understand, produce a very severe catarrh of the whole intestine, which may even end fatally.

Modes Of Infection—This is evidently indirectly from one infected person to another. This is most apt to occur from eating uncooked infected food, particularly raw fruits and lettuce, etc., used for salads. There is an unfortunate habit among many truck gardeners in this region of using the so-called "natural fertilization", that is, of saving their urine and feces and pouring them over the plants and on the ground where they grow. Open latrines, insects, lack of cleanliness at toilet, personal contact, and other similar factors are no doubt of importance. I have never seen the transfer of this infection from any patient under my care to another member of the family.

Biology—I will not take up the biology as this has been given in detail in numerous articles published recently. Most of the cases seen harbored only one flagellate, but double infections were noted. As far as I could tell, the variety of the parasite could not be predicted from the symptoms. The trichomona was by far the most frequently noted flagellate.

It seems that in many cases, as time passes, either the parasite gradually loses its virulence or immunity is developed by the patient, as symptoms gradually become milder and less frequent, a clinical cure resulting, even when some of the flagellates can still be found on examination.

Pathology—The localization of this infection is nearly always in the intestines, including all of the small intestines below the duodenum, and the whole colon. I have made gastric analyses on many cases harboring these organisms, both those presenting symptoms apparently due to them and those in whom the infection was incidental. In these many of the specimens were examined soon after removal, and in none did I find the flagellates, whether there was free HCL or not. None of the cases I saw developed liver abscess.

The pathological process, at least in the milder cases, seems to be a simple catarrhal condition with congestion of the mucous membrane. Some may have patches of ulceration, and some of the severe cases have reddening and inflammatory thickening of all the coats of the bowel. One fatal case I saw, and on whom autopsy was performed, had no ulceration, and the evidence of inflammation were not very marked. The principal changes were in the sigmoid flexure, and were

especially thickening of the mucosa and submucosa. No other pathological condition was found that could account for death, which was without doubt caused by the diarrhea and toxemia due to the parasite. I believe that in many of these cases the flagellates burrow beneath the epithelium, and, in the more severe chronic cases, even invade the muscularis. The appearance of the bowel in the case mentioned below would suggest this. Also, if all the parasites were on, and not beneath, the mucous membrane, it should not be so difficult to completely eradicate them, as the drugs used are extremely toxic to them, and as administered certainly reach all parts of the mucous membrane.

In many cases, after symptoms have lasted for some time, there is evidently a secondary bacterial process engrafted on the original infection, which continues to give much trouble even after the flagellates have been nearly completely eliminated. As far as I could tell, peritoneal adhesions have not been produced in any case that I have seen.

A patient I saw in 1915 had shortly before had an operation, the surgeon suspecting a gall-bladder inflammatory condition. This organ was found to be somewhat reddened and was drained; but also the liver was slightly enlarged, with reddened surface, and the whole small intestine, begininng at the jejunum, and all of the colon were somewhat thickened and congested. After operation the attacks of chills and fever at irregular intervals, pains in the abdomen, and very obstinate constipation continued as before. The feces examined, resulting from salts, contained a seething mass of trichomonas. She only slowly improved under treatment, and is evidently still suffering from the infection, judging from a recent report from the mother. The Wassermann reaction was negative, and there were no malarial parasites in the blood. Soon after going home, she passed from under my observation.

Clinical Types—These are the silent, acute and chronic. The silent cases are those in whose feces the flagellates are found, usually only a few, and who have other conditions that account for their symptoms. It is just possible that the principal condition in some of these may have been caused by such a mild infection that was producing apparently no

symptoms. A similar series of pathological events is not at all rare in digestive work, that is, a slight condition leading to another, and this in turn to others, each being more serious than the preceding.

In the acute cases diarrhea is the predominating symptom and I have only seen one with obstinate constipation.

In many of the chronic cases there is more or less looseness of the bowels nearly all the time; others have definite attacks of diarrhea with intervening periods in which the symptoms are intestinal fermentation, slight soreness or uneasiness in the lower half of the abdomen, especially at the cecum and sigmoid flexure, and lack of energy and other signs of intoxication. Some are free from symptoms between attacks, with regular bowels or slight constipation.

The acute cases and exacerbations in the chronic cases are more common in warm weather, although I have seen both in the cool and cold months.

Symptomatology—As the intestinal symptoms predominate in these cases, they will be taken up first. Diarrhea is present in practically every case. In the acute cases there are usually 8 to 12 movements a day, but there may be as many as 20 or more. When severe, they occur whenever fecal material gets into the sigmoid flexure, and rectum, and also when anything is put into the stomach, even water. In milder cases there are several movements soon after rising in the morning and 1 or 2 after each meal.

In chronic cases, during the periods of diarrhea, there are generally 3 to 7 movements a day, and in the intervals between attacks the bowels are usually regular or constipated, or there may be a slight tendency to looseness, in which case the feces are apt to be fluffy with gas.

Feces—During the diarrhea the stools are usually semiliquid and mushy, often fluffy with gas bubbles, or watery, and soft particles in them. Sometimes they are made up of nearly pure brown mucus, at times gelatinous and thick, occasionally so much so that a specimen for microscopical examination can be taken up with difficulty on a platinum loop. Usually the mucus is in clear pieces of variable size and is seldom bloody. In several cases I have seen casts of parts of the colon, and in one a cast of apparently the whole

colon. The odor when there is diarhea is usually sour, seldom foul, with all variations between the two. Sometimes it is very much like that of sweet pickles, and I thought at one time that this was characteristic of severe infections, but have noticed it several times and when there were no flagellates present.

Microscopical—Flagellates are always readily found, sometimes in incredibly large numbers, the whole field being a seething mass of them. In some cases a few only are found in the ordinary stool following a test diet, or even in a diarrheal movement, and when a specimen from the same individual is examined, resulting from a dose of salts, they are moderately, or very, numerous. This would suggest that they cling tightly to the surface of the mucous membrane, and are washed off in large numbers by the outward osmosis resulting from the salts. I do not believe that this is due to increased propagation resulting from the laxative.

Leucocytes. In the severe diarrheal cases there are usually many present in the mucus and also in the liquid portion of the feces. With moderate diarrhea, usually recurrences of the chronic cases, there are some in the mucus and only a very few in the fecal material.

Red blood cells. These were noted in the severe, acute cases and also in recurring diarrheas, when the symptoms were marked, but were usually not present when the infection was slight or moderate.

Pain in the abdomen. This is seldom marked. In the severe acute cases the whole abdomen is moderately sensitive to pressure, even in the epigastric region. The pressure of a belt or skirt around the waist is uncomfortable. There is subjective uneasiness all the time. Occasionally there are cramps, but this usually only when there is much gas. In the diarrheal recurrences of the chronic cases the pain and tenderness are usually located around the umbilicus and over the whole lower abdomen, and in the intervals, if present, is in the mid-abdomen, or at the cecum or sigmoid.

Symptoms on the part of the rectum are not always present. Frequently some pain or discomfort before, during or after defecation are noted, but these are generally not marked. I have never seen them as intense as are observed in cases of

amebic and bacterial dysentery. There may occasionally be slight nausea after eating in severe cases, but I have not seen vomiting result from it. In severe acute cases loss of weight is marked, being 1 pound or more a day. One patient lost 25 pounds in 3 weeks. In chronic cases the weight is usually maintained at less than the usual level. The strength generally runs about parallel with the weight except that it is more dependent upon the amount of toxemia present.

In severe cases anemia is moderate or marked. In the moderately severe or mild cases the hemoglobin is normal or only slightly diminished. Indicanuria is present in practically all cases and is usually marked. In severe cases it is very intense.

The general symptoms of toxemia are lack of energy and endurance, nervousness, irritability, tendency to worry; indefinite pains in the back, muscles and joints; insomnia; and in women disturbed menstruation. Other conditions, when present, are apt to be exaggerated, such as neuralgia, hysteria and chronic tonsillitis.

Diagnosis—This is, of course, made by finding the flagellates in the feces, with the elimination of other probable causes. If these organisms be found in moderate numbers in a routine examination, a dose of salts should be given and the resulting stool examined while fresh and warm. Large numbers of flagellates present with no amebae would be suspicious. A case of diarrhea with 8 to 12 movements a day due to the ameba histolytica would nearly always have the mucus at least tinged slightly with blood, with the organism easily found after a dose of salts, with definite evidence of ulceration, and with flagellates absent or present in only small numbers. When bacillary dysentery is suspected a culture of the feces should clear up the doubt. To confirm the diagnosis, administration of drugs injurious to the flagellates should quickly put a stop to the diarrhea, while it would not do so in cases of amebic dysentery, unless large doses of bismuth were given.

Prognosis—In the acute attacks the diarrhea is usually easily stopped by the administration of methylene blue, bismuth and other drugs, but it is quite another matter to completely get rid of the parasite. The organisms fasten themselves tightly

to the epithelial cells of the mucosa, and most of them can be washed into the lumen of the intestine by salts and killed by a number of remedies, but enough of them usually remain to raise a large progeny and make the case chronic. Very rarely can all of the parasites be readily killed. After the case has lasted some time a catarrhal condition of bacterial origin frequently arises. This should predispose to appendicitis, gastric and duodenal ulcers, and gall bladder infections, but I have not seen any cases of these latter conditions that I could trace to this cause.

I have seen two fatal cases in which the diarrhea was uncontrollable, but this was before I knew of methylene blue, and the effects of large doses of the bismuth salts and calomel. I am sure that neither of these cases had amebae and that the flagellates were the sole cause of the trouble.

Treatment—When it is certain, or strongly suspicious, that the flagellates are responsible for the condition of the patient, a persistent effort should be made to get rid of them. It is usually fairly easy to get a clinical cure, without killing all the parasites present, but in this case, upon discontinuance of treatment, the organisms increase greatly in numbers and the symptoms return. A number of drugs and methods of treatment have been advised by clinicians of experience, and I have given nearly all of them a good trial, without satisfactory results. The limiting of the diet has no curative effect on the infection. During the period of active treatment the diet is best cut down to soft boiled and poached eggs, milk, bread, toast, butter and water. Between these periods, in cases of failure to cure, the diet is adjusted to the patient's digestive capacity.

Enemata are not curative, as the infection exists in the small intestines as well as the colon, but they can wash away the parasites in the lumen, and drugs put into the water can kill many or all adhering to the mucous membrane of the colon. During active treatment 2 enemata a day are advised, each of 3 pints of water containing 1-5 grain of copper arsenite to a pint. This concentration is much greater than is needed to kill the parasite, and does not irritate the colon.

I use salines regularly in acute cases and in periods of intensive treatment in chronic cases. They act by washing the

parasite off the mucous membrane and carrying them away. After a dose of salts, when no other medication is given, the flagellates in the feces are very active, so evidently there is no antiseptic effect. When given in conjunction with a drug antagonistic to the parasite, the absorption of the drug is greatly diminished, and it has its full therapeutic effect.

Specific Drugs—In my earlier experience I used powdered ipecac preceded by large doses of laudanum, daily injections of emetine, and alcresta tablets. Patients improved a little on this line, but reached the limit of improvement in a few days, and the diarrhea would not be checked. On that account I have discontinued their use in these cases. Recently I have tried bismuthous-emetine-iodide, (B. W. & Co.) which has been extensively used in Europe in amebic cases, with the same result. I have used Chaparro amargoso a great deal. The fluid extract, in 1 to 2 teaspoonful doses, 3 to 5 times a day, according to how well the patient can take it, is decidedly beneficial, but will seldom rid the patient of the parasite. It is useful both in intensive treatment and in the intervals.

Iodine is beneficial, and in recurrent cases with slight diarrhea and fermentation, will frequently relieve the patient of symptoms in 4 to 6 days. It is best given in 5 to 10 drop doses of the tincture in milk into which bread or crackers have been placed, or in Mellin's Food and water, using enough to completely bind the iodine. In this way the iodine is released gradually by digestion of the food used, in just the part of the bowel where its action is most needed. Larger doses than 10 drops usually cause burning in the stomach, but some patients can take as many as 25.

Bismuth subnitrate and subcarbonate have a decidedly antiseptic effect on the flagellates but only when given in very large doses, about one rounded teaspoonful at least 4 times daily. In one very severe case reported below, the diarrhea was uncontrollable until this was resorted to, and the patient would probably have died if this had failed. The diarrhea was suddenly stopped, and as a saline was not then used, there were marked symptons resulting from the absorption of toxines from the destroyed bodies of innumerable dead flagellates. The bismuth did not kill all of the parasites in this instance, and the case became chronic. I have not had a case

in which the bismuth salts killed all of the parasites. I generally use a mixture of the two salts, ¾ of the subcarbonate and ¼ of the subnitrate, to avoid the nitrite poisoning that might result from too large a dose of the subnitrate.

Methylene Blue was first used by Castellani, with good results. I did not know of its use until I had seen the two fatal cases and the one above mentioned in connection with the bismuth salts. Next to the copper salts, it has as great a killing effect on the flagellates as any drug known. In acute cases, and in the diarrheal recurrences of chronic cases, it will put a sudden stop to the diarrhea, having this effect in several days, unless the diarrhea be due largely to secondary bacterial entero-colitis. This drug sometimes temporarily increases the amount of mucus in the feces, in these latter cases.

It may be used in several ways. Given in 5 grain doses after meals it will control the recurring diarrhea of chronic cases, and also the fermentation between attacks, and makes a good preparation for intensive treatment. In these intensive periods I use it in 5 grain doses about 1½ hours before breakfast with a dose of salts, and at bedtime with a large amount of water. When given with salts in the morning the flagellates are washed into the lumen of the bowel, where they are readily acted upon by the drug, and the absorption of the blue is much diminished, thus keeping the solution of the drug as concentrated as possible. Given at bedtime, there is very little food, if any, left in the stomach, to diminish the concentration of the solution by staining of food particles and the absorption of the watery solution by a mucous membrane gets the drug into closer contact with the flagellates that are adhering to the epithelial cells of the small intestine than occurs when salts are given, thus giving probably the maximum effect.

The disadvantage of using methylene blue is the strangury produced. Even 5 grains will often cause very disagreable burning micturition, and 5 grains 3 times daily for several days is almost unbearable.

Dr. H. L. McNeil of Galveston, Texas, (1) recommends the use of a solution of methylene blue, quinine sulphate and HCL, administered by duodenal tube in these cases. He follows each such flushing with an enema of methylene blue, 1 to 5000. I

have not used this method, as the drug when given by the stomach is not absorbed by that organ, at least to any considerable degree, and passes into the duodenum without being altered by the HCL of the stomach. He claims to cure most cases by 3 such flushings.

Copper salts are extremely injurious to the flagellates, being fatal to them in a dilution of 1 part to 5,000,000 at least, and probably as high as 1 to 20,000,000. I use the arsenite, and give it in doses of 1/100 to 1/50 grain 3 or 4 times daily. It usually has a decidedly good effect therapeutically, but does not kill all of the parasites, as it is apparently readily absorbed and does not satisfactorily reach the organisms adhering to deep folds of the mucous membrane.

Calomel I have used in a number of cases, two of which are reported below. A cure was not obtained, but the parasites were greatly reduced in number, and the toxemia was much benefitted.

Dr. Anthony Bassler, of New York, (2) reports success in curing this infection by means of hypertonic saline solutions given by duodenal lavage. He administers daily a solution containing per liter, 9 grams each of sodium sulphate and chloride, 4 c. c. of a 10% alcoholic solution of phenolphthalein, and 1 teaspoonful of sodium bicarbonate. I have used this method, but have not been able to kill all the parasites by this means. However the cases were greatly improved.

Case 1. Male. White. Age 50. Railroad section master in Florida. First seen June 1st, 1914. Except for slight cough and expectoration the history was negative to the present illness, which began just after Christmas, 1913. At first there were 3 or 4 liquid or watery movements a day, without pain in the abdomen, and he saw no mucus or blood in the stools. This gradually increased until he was having 3 to 6 movements in the day, and 8 to 10 at night. There were no cramps and no tenesmus. At this time he noticed mucus in the stools, but no blood. He did not improve under treatment, and lost 3 pounds before coming west.

Present condition. Appetite good; considerable gas formation in stomach and intestines; the taking of food, or even water, into the stomach very soon causes a movement. He has about 8 movements a day, and the same number at night. Feces watery, have very bad odor, and have some mucus, but no blood. Rectum is negative. He sleeps poorly; occasional dizziness; slight edema of feet in the morning, increased on exertion during the day, and is more noticeable in the right leg than in the left. No fever; strength is very poor. Dyspnea easily; rapid pulse. Slight cough; small amount of white expectoration daily. No pain in chest.

Physical examination. Height 5 feet, 10 in., weight 105, T. 98.4°, P. 124; irregular, intermittent. Appearance anemic. Slight consolidation of both lung apices, but these are apparently healed

lesions. Abdomen—slight tenderness of middle and lower abdomen, most marked at end just above the umbilicus. Liver, spleen and colon negative.

June 2. Took a dose of salts and passed feces in the office for examination. Moderate amount of mucus; guaiac reaction of occult blood negative; microscopically, numerous flagellates; a few leucocytes; no amebae or red blood cells. Treatment:—bed; diet of toast, butter, milk, and water. Epsom salts early morning. One-half grain of emetine injected twice daily for 7 days. Enema twice daily of 3 pints of normal saline solution. Strychnine 1/30 grain 3 times daily.

June 6. Change enema solution to 3 pints of water with 3 teaspoonfuls of quinine hydrochloride, followed by normal saline to wash away excess of quinine; this was continued for 4 days, and then 1 a day for 7 days. Diet slightly increased. The condition gradually improved; movements were reduced to 4 or 5 in 24 hours; the odor greatly diminished, and the visible mucus stopped. He ate very little, and lost some in weight and strength.

June 15. Urine: Color, amber; Sp. gr. 1.019; sediment, great deal, light, white; no albumin or phosphates; urates, trace; no sugar; indican, intense. Microscopical, negative.

June 25. Fl. ext. chaparro amargoso begun, 1 teaspoonful 4 times a day.

June 30. Bowel condition improved. July 9. Diarrhea stopped and his condition is much better. Having only 1 movement a day, in addition to a cleansing enema. He died on August 25, and I was told that, considering himself all right he had stopped treatment, and soon after became associated with Christian Science. The trouble soon returned, and he died without treatment.

If this had been a case of amebic dysentery, I would certainly have found the parasite, considering the severity of the case, and the number of stools examined. A chronic bacterial dysentery would have shown a large number of leucocytes and red blood cells, and a tuberculous ulceration of the bowel would not have improved to any extent under this treatment.

Case 2. Female. White. Age 34. First seen on December 31, 1918. History negative until 23 years of age, when she had an acute attack of diarrhea in Prescott, Arizona. There were 15 to 18 movements a day, without blood or mucus in the stools, and pain in the lower abdomen. She recovered in 2 weeks. At this time she weighed 123 pounds; loss of weight and falling of the hair began then. She remained well until two winters later, when she had an attack that lasted 2 days. There were 16 movements a day, and slight pain in the abdomen. Castor oil checked this attack, but her bowels were not normal again for 3 weeks. Seven years ago she had another attack, which lasted only a few days. After that she usually had an attack about every 2 or 3 months, lasting 2 to 5 days, which were relieved by cutting down the diet and taking castor oil. She was free from symptoms between the attacks. These gradually increased in frequency, until by the beginning of last summer she was having attacks about every 6 weeks. Summer before last there was an attack, during which she noticed bloody mucus in the feces. Last August she had an attack lasting 4 days in which she had 8 movements in a day, and 4 to 6 at night, with pain in the rectum and bloody mucus in the feces. She usually recovered strength rapidly after attacks, but did not do so after this one. Since then she has lost a great deal in weight and strength, has had gas formation in the intestines, and been constipated. Two

weeks ago another physician examined her and found numerous flagellates in the feces, but no amebae; haemoglobin was 90%.

Present condition: Tongue coated; poor appetite; stomach negative; considerable borborygmus; no pain or soreness in the abdomen now; burning sensation in rectum when she takes an enema; poor strength; head occasionally feels light; is very nervous.

Physical examination: Weight 93; T. 99.2°; P. 84; color, not good; hemoglobin 90%; heart and lungs negative; stomach is in a slightly lower position than normal and there is splashing on shaking; slight discomfort in lower part of epigastric region on pressure; slight pain to pressure at and just below the umbilicus; tenderness at descending colon and sigmoid flexure, and pressure there causes slight pain at the cecum. Stomach contents, result of test-breakfast—small amount of thick white mucus in specimen; odor slightly sour; no occult blood; HCL, 11 degrees; total acidity, 24 degrees; microscopical, made immediately after removal—no flagellates found. Examined the feces resulting from a dose of salts twice, (passed in office)—mucus in small clear pieces and a few small white shreds; few epithelial cells and leucocytes in the mucus; no red cells; no amoabae; flagellates fairly numerous both times.

She has been under constant treatment since then. The drugs used were methylene blue, arsenite of copper, chaparro amargoso, tincture of iodine, calomel and sodium phosphate; liquid petrolatum when constipated, and iron for the anemia. She at times passed casts of the colon, one of which was more than a yard long. The methylene blue increased the mucus formation. On the possibility of her having amebae that I could not find, I injected 2/3 grain of emetine for 6 successive days, with no benefit. Improvement gradually occurred, but control stool examinations still showed the flagellates. On April 28 to May 12, at the bedtime, 10 grains of calomel were taken, followed each morning by sodium phosphate and 1/25 grain of copper arsenite. On May 16 feces resulting from a dose of salts were examined and flagellates were present, but slightly fewer than before. On May 19 at bedtime she took 5 grains of calomel, followed by sodium phosphate with 1/25 grain of copper arsenite in the morning, and after 5 movements took an enema of 3 pints of water containing six 1/100 grain copper arsenite tablets. On May 23 examination of the feces showed the flagellates present, but much reduced in numbers. On May 23 at bedtime she took 10 grains of calomel; early next morning a saline with 1/25 grain copper arsenite, and after several watery movements, an enema of 3 pints of water with 15 grains of methylene blue in it. On May 27 the feces were examined after a saline, and flagellates were found, as on May 23. The feces have been examined repeatedly since then, with the flagellates always present.

Case 3. Male. White. Age 42. In the summer of 1914 he had a very severe acute infection with the flagellates. There were 8 to 10 movements a day until the condition was checked, which was in about 3 weeks. There were usually at least 2 in the morning before breakfast, 1 or 2 after each meal or putting anything in the stomach, even water, and 1 or 2 in the night. The feces were usually soft and mushy, occasionally watery, and a few were of pure, very thick mucus, much like thick gelatine, and so tenacious that it was difficult to get a platinum loop into it for removal of a microscopical specimen. Leucocytes and red cells were present, but not nearly as many as would have been found if there had been amebic ulceration. Flagellates were extremely numerous and no amebae were found, although numerous specimens were examined, both from diarrheal stools and as a result of salts. There was marked sensitiveness, rather than pain, all over the abdomen, both subjectively

and to pressure. There were discomfort and slight tenesmus in the rectum. He lost 25 pounds in 3 weeks, and greatly in strength. One grain of emetine was injected daily for a week, with only slight improvement. Alcresta ipecac seemed to irritate. Chaparro amargoso diminished the diarrhea, but did not stop it. Finally 1 rounded teaspoonful of bismuth subcarbonate was given after each movement, with the result that the diarrhea was suddenly checked. Then began an apparent rheumatism of both hips; the pain was moderate only, and was accompanied with rather marked weakness of the thigh muscles, so that walking was difficult. Flagellates have been found at every examination of the feces since then, but no amebae. There have been many attacks of slight looseness of the bowels with fermentation, and also a pronounced diarrhea, especially in the warm months. Between attacks there has frequently been intestinal fermentation, inability to digest anything like a normal diet and constant marked indicanuria. General symptoms of toxemia have been marked and constant: diminished energy and strength, nervousness, irritability, subnormal appetite, and occasionally slight fever.

He has used methylene blue, copper arsenite, chapparro amargoso, iodine, bismuth-emetine-iodine and calomel; these alone and in conjunction with sodium phosphate. All of these, except emetine-bismuth iodine, fairly readily controlled the diarrhea and fermentation, reduced the intoxication somewhat, and markedly reduced the number of flagellates present. The one that had the quickest effect was methylene blue. The intestinal symptoms have been slight only for several months, but an examination of the feces, following a dose of salts, showed flagellates still present. Calomel was administered to this patient as follows: 10 grains on May 10, with salts the next morning; flagellates found 2 days later after a dose of salts. Beginning with May 18, 5 grains were given every night for 4 night with saline in the morning; flagellates still present. On May 25 ten grains given at 9:30 A. M., and also at 10 A. M., on empty stomach, followed by large doses of saline at 1:30 and later. May 27 no flagellates found in a natural movement, but on May 28, after dose of saline, a few were found, but these were very much fewer than at previous examinations.

Since the first dose of calomel this patient's general condition has improved greatly. Almost for the first time since 1914 he had energy and his strength had increased; there was very little fatigue even after a hard day's work; and he was able to think more clearly and his memory improved.

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THE IMPORTANCE OF BLOOD SUGAR ESTIMATION IN THE DIAGNOSIS AND TREATMENT OF DIABETES.*

By F. M. Johns, M. D., Asst. Professor of Medicine, Tulane University, New Orleans.

With the advent of a routine urinalysis as a prime requisite in practically every medical examination, the number of cases

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of diabetes found has grown so enormously in the past decade that the actual importance of this serious disease is just beginning to be appreciated by the medical profession. Diabetes is certainly one of the conditions where the earliest possible diagnosis and prompt institution of correct dietary treatment give results in actual years of life to the patient. We are only too prone to excuse the finding of a little sugar in a patient's urine as being due to dietary excess. Practically every individual who shows glycosuria at any time is at least a potential diabetic. More accurate study of the intake, metabolism, tolerance, and excretion of carbohydrates in these individuals furnishes information which usually leads to earlier correct diagnosis. Of the many necessary studies in a given case, that which furnishes information as to the amount of sugar maintained in the circulating blood is of paramount importance. Developments in recent years of accurate and yet simple methods of making these determinations have placed blood sugar determinations within the reach of most clinical laboratory workers.

In order to bring out more clearly the importance of blood sugar estimations, it may be useful to review in a general way the fundamental principles of sugar metabolism as we now understand them. Briefly, starches and polysaccharides of our diet are converted into such simple sugars as glucose and levulose in the processes of digestion. These are absorbed directly by the capillaries of the intestinal villi, which lead into the portal vein. There they are brought into contact with blood which contains the internal secretion of the pancreas. As a result of the presence of this internal secretion from the pancreas, the sugar can be taken up by the liver and stored as glycogen whenever the concentration in the blood goes above the normal figure of 0.08% to 0.12%. Between digestive periods the glycogen is reconverted by the liver into glucose and is turned back into the circulation as needed.

In order that sugars may be taken up from the blood stream by the liver first, or the muscles and organs later, the tissues must be either activated by pancreatic secretion, or what is more probable, the sugar must combine with the pancreatic enzyme, in which combination it is able to pass into the muscle or organ where it is burned to furnish energy. In order that

the supply of sugars may remain approximately uniform in the blood, not only does the liver store up surpluses, but if the sugar content goes beyond this point the excess may normallly be excreted by the kidneys. The degree of concentration in the blood stream at which the kidneys begin to function as a spillway is spoken of as the renal threshold. Normally the renal threshold is from 0.16% to 0.18% of blood sugar. If more carbohydrates are taken in than the liver can store, the concentration of the blood increases slightly above these figures and the excess is excreted in the urine with an accompanying polyuria.

A blood sugar above 0.18% is seldom found in a normal individual. In the presence of a large excess of carbohydrates in the intestinal canal, the digestion and absorption of these substances are slowed down before an increase in blood sugar above normal limits is reached.

There is a small percentage of individuals, however, in whom digestion and absorption continue to such a point that sugar appears in the urine. These are cases of true alimentary glycosuria only when the renal threshold is normal, the liver function is normal and there is no intolerance for sugar.

We may now consider the prime factor of the mechanism of the disordered metabolism in diabetes—the intolerance for sugars.

In normal individuals the energy that may be developed from the burning of sugars in the muscles is directly dependent upon the amount of sugars available. In true diabetics the ability to get sugars stored up by the liver, or taken from the blood into the tissues where it is used, is just the opposite to that found in normal individuals. That is, that the ability to use sugars is indirectly proportionate to the amount of sugars ingested and absorbed into the blood stream. The pancreatic internal secretion, being produced in a smaller amount than normal, is probably only capable of combining with or activating a smaller quantity of sugar. In the presence of a larger quantity of sugar this weakened action is, so to speak, diluted, and the availability of sugars is disproportionately lowered. It is for this reason that in diabetes we have a higher renal threshold, an accumulation of blood sugar, and a starving musculature. It is only when the blood

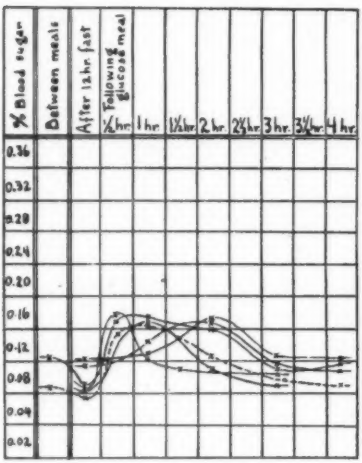
sugar approaches the normal figures that sugar begins to be made available to the tissues, so that the estimation of blood sugar serves its most useful purpose in the control of a known case, and ranks in importance only next to the general clinical condition of the patient as an index of the balance of carbohydrate intake against tolerance.

The sugar content of the blood is much more reliable as an index to the general tolerance and condition of the patient than that of the urine. Not that urine sugar estimations should be dispensed with, but they should rather be supplemented by an occasional blood sugar check. I have seen several diabetics with a gradual loss of tolerance in whom the amount of urine sugar remained fairly constant or was constantly absent while on the prescribed diet. One long-standing case in particular was marked by a fall from the usual urine sugar reading to an occasional trace over a period of many months, during which time the blood sugar rose very high. This case terminated in coma of several weeks' duration and died, being entirely free from urine sugar all the while.

In the diagnosis of diabetes it is often difficult to arrive at a correct diagnosis without a long clinical and dietary study. The finding of a hyperglycemia (blood sugar above 0.12%) not caused by dietary excesses justifies a fairly certain diagnosis of some disorder of carbohydrate metabolism. A reading above 0.2% justifies a diagnosis of diabetes, barring, of course, the possibility of a technical error. It is well to repeat the reading for verification before making a final diagnosis.

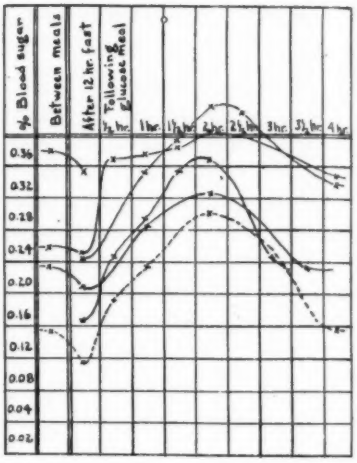
The diagnosis of an early or particularly a mild case of diabetes often leaves a good deal of uncertainty under ordinary conditions. This is most unfortunate for the patient, as it requires a thoroughly convinced physician to keep an apparently healthy individual on a restricted diet. Here a study of the sugar metabolism is of great value. The rise and fall of the blood sugar taken at periodic intervals following a glucose meal on a fasting stomach when plotted to form a curve shows with marked accentuation the delayed absorption, the maintained hyperglycemia, and the delayed fall to the particular individual's normal height of concentration.

Blood Sugar
Glucose Tolerance Tests.
Table I



—— Normal Curves.
----- Renal Glycosuria Curve
Note the uniformly low rise of sugar %, and the early return to normal values

Blood Sugar
Glucose Tolerance Tests.
Table II



—— Diabetic Curves.
----- Early Diabetic curve
Note heights of sugar %, and length of time required to return to an individual normal.

A great deal of stress has been laid on the determination of the renal threshold by correlated blood and urine sugar estimations following a glucose meal. The importance of these figures for diagnostic purposes shown in the cases that I have studied has been practically nil in any except frank cases of renal diabetes. The reasons for this are principally because the tolerance of mild diabetics varies so much, the rise in the renal threshold is often very slight, there is quite a percentage of error in the blood and urine sugar estimations, and finally because the urine collected represents usually a previously falling or rising curve.

There are a few individuals in every series of cases who, after all is said and done, remain borderline cases so far as an uncontroverted diagnosis is concerned, cases that show some slight fault in metabolism in which blood values and intolerance are only a little beyond the normal figures. These,

I believe, are correctly diagnosed potential diabetics. I allude to these cases to emphasize the fact that the blood sugar estimation is merely another human laboratory test. It cannot be considered an infallible means of diagnosis and should be considered as diagnostic only when the picture is beyond question. Where less diagnostic findings are obtained the importance of the examination lies in the ability of the physician to properly interpret results in the light of such other findings as may be present in the given case.

In conclusion, I would like to call attention to a grave error that is occasionally made. The majority of physicians and laboratory specialists direct a twelve hour fast (over-night and before breakfast) for the blood sugar estimation. The great majority of early or mild diabetics will give blood and often urine readings within normal limits under just this small degree of restraint. I have seen several cases that later showed a true intolerance for sugar whose physicians had been misled by a single examination giving a normal blood sugar figure. In these cases a study of the sugar metabolism as shown by the glucose tolerance test is of paramount importance.

DISCUSSION

Dr. I. I. Lemann, New Orleans: Dr. Johns has very properly laid the greatest emphasis on the fact that individuals showing sugar in their urine from time to time are not to be regarded as simple cases of alimentary glycosuria but as potential true diabetics. That dictum is wise and I think in the future will prove to be of the greatest value in the care and treatment of diabetes. He has reviewed briefly the physiology of carbohydrate metabolism. There are several things I would like to add to what he has said in order to elaborate them. According to Allen's notion, sugar glucose behaves differently in the bodies of normal individuals than in those of diabetics. In the normal individual the glucose behaves as a crystaloid, or behaves as a colloid, according to the method by which it is taken into the body. If one injects glucose solution directly into the blood stream of a normal individual, glucose appears promptly in the urine of that individual. On the other hand, if sugar is taken by mouth or by injection instramuscularly, the sugar does not ordinarily appear; unless the economy is overwhelmed with sugar, sugar does not appear in the urine. On the other hand, in the case of a diabetic, whether you give sugar intravenously or by mouth, or parenchymally, sugar appears in the urine, so something happens in the body of the diabetic which does not happen in the body of the normal individual. The normal individual has some substance which grabs hold, as it were, of the sugar when it is introduced in any other way than directly into the vein and binds the sugar to the tissues. There is something in the nature of an ambocepter, as Allen suggests. This grasping, this binding substance, is absent in the diabetic and because of its absence the sugar is not bound to the tissues and overflows through

the kidneys. In the case of the diabetic, therefore, we are reproducing all of the conditions of the kidney function tests in the ordinary individual. If you are making the kidney function test in a normal individual by means of glucose, one judges the ability of the normal condition of the kidney by the fact as to whether sugar appears in the urine or not. A bad kidney will hold back the sugar, and a good kidney will filter it through. In the case of the diabetic he already has an excess of sugar. He has treated himself with a glucose injection, and if he has a bad kidney it will hold back that excess of sugar. If he has a good kidney, the excess of sugar will go through. In other words, a diabetic with a bad kidney may have no sugar in his urine and still be in a bad way. Such was the case of the man who had a diabetes of very high grade, a man who died in coma, yet had no sugar in his urine because his kidneys were so bad they could not excrete the excess. The renal threshold is a matter of extreme importance in judging of the condition of a diabetic patient.

Dr. S. C. Jamison, New Orleans: The subject has been so thoroughly covered by Dr. Johns and by Dr. Lemann that there is very little left to say.

In speaking of the various fluids getting through I would call attention to the fact that the old controversy over the presence of sugar in the spinal fluid appears to have been definitely settled. For years we have known the spinal fluid reduces Fehling's solution, and in the average text on the subject this fact is mentioned, but no outspoken statement has been made until recently that this reduction of Fehlings solution was actually due to glucose. It has been shown recently that the substance present rotates polarized light; that it is a ferment which reduces Fehling's and other solutions for sugar and there seems to be no question that glucose is the substance which is responsible for the reduction. Furthermore, it has been shown that in diabetes mellitus the glucose and spinal fluid are greatly increased in quantity. We know that this glucose very probably largely furnishes the nourishment for the delicate cells in the central nervous system. I think future research will show that perhaps in a great many cases the nervous symptoms in diabetes are due to a perversion of the quantity of glucose in the spinal fluid.

TWO CASES OF LEPROSY CURED BY ANTHRAX VACCINE.*

By J. N. ROUSSEL, M. D., New Orleans.

Since the time of Moses, leprosy has been the bug-bear of the human race. Little has been left undone in an attempt to cure the unfortunate victims, and I think up to this writing, little has been accomplished. Ever so often some one has come out with the startling announcement that he has at last found a cure, but it has not taken long to have it demonstrated to their satisfaction and that of the medical profession, at large, that while their observations were fairly correct their deductions were wrong.

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*Read before the Louisiana State Medical Society, meeting April 19 to 21, 1921.

It has not been an uncommon observation that a spontaneous cure of leprosy has occurred, but as compared with the vast number that persist, unabatedly, to the end of time, as far as the victim is concerned, we can safely say that the abortive cases do not compose a large percentage of the whole. Hansen, of Norway, states that of 8453 lepers who have been recorded in the leper statistics of Norway, from 1856 to 1895 there are 126 cases tabulated as being cured. This is just one and one-half per cent of the whole, which is not encouraging, to say the least.

What shall constitute evidence of a cure, is of course a moot question.

Thin says: "If a patient loses all symptoms of tubercular leprosy and enjoys good health but retains some slight symptoms of nerve leprosy of an unprogressive character, the case may be considered as much of a case of cure as a case of phthisis in which all symptoms have become arrested, although the patient is left with a patch of fibroid tissue in his lung in which doubtless the spores of tuberculosis are embedded." Of course, many of the profession are unwilling to accept this, and while admitting that the disease may be permanently arrested, deny that the patients are cured, unless it can be demonstrated microscopically that no bacilli exist in any of the tissues. This, of course, is ideal, and should be the attitude of the profession, if it were not for the unfortunate fact, that in a very large percentage of the cases (nearly all of the maculo-anesthetic cases) the demonstration of the presence of the bacilli appears to be extremely difficult, if not impossible at any time.

This brings us to the question as to whether we should make a diagnosis of leprosy in cases in which the bacillus is not demonstrable. I think, we undoubtedly should, but I shall not quarrel with my opponents on this score.

With these few remarks, I wish to report two cases of leprosy clinically cured by the hypodermic use of the anthrax vaccine. I mean cured, in that they are entirely free of any of the cutaneous or nerve manifestations of the disease.

The vaccine employed was liquid anthrax vaccine made by the H. K. Mulford Co., for the immunization of animals

against anthrax or charbon, which, I understand, contains the living anthrax organism.

Case 1.—Mrs. S. A. about forty years of age applied at the Touro Clinic in the early part of February 1919 for treatment of her skin.

On examination we found numerous lesions on her face and many on the arms and legs and body, only a few of which were anesthetic. They were mostly tubercular infiltrations forming rather large tubercular masses from the fusion of contiguous tubercles. There were a very few macules which were mostly on her body. There was a pronounced leonine expression and her voice was husky.

A clinical diagnosis of tubercular leprosy was made after which she was sent to Dr. F. M. Johns for findings. Dr. Johns reported acid-fast bacilli found. She was given 1/4 **CC.** liquid anthrax vaccine on February 25, 1919 and twice a week thereafter in gradually increasing dosage up to 1-1/2 **CC.** until April 3, with no apparent effect except a slight sensation of chilliness which occurred about five or six hours after the injection.

On April 3rd. all of the lesions were acutely inflamed and had changed their morphology. The infiltrations had disappeared and in their stead there were large nodules about the size of a hickory nut. They were sharply limited, firm and dense. On April 7th., four days later, her general condition was apparently worse. She complained of very stiff joints and general uneasiness. The appearance of the nodules had not changed.

I did not see her again until March 2nd. 1921, when she appeared entirely well and reported that the lesions had begun to disappear in June 1919, about two months after stopping the vaccine, and were all gone in a very short time.

Case 2.— March 2, 1919. Mrs. J. T. D. applied at the Touro Clinic for the treatment of a skin condition which she claimed appeared about six weeks before.

Upon examination we found five macules on right arm, one large infiltrated mass in palm of right hand one macule on left arm and several on legs and body. She complained of a severe neuritis in right arm, but otherwise appeared to be well.

A clinical diagnosis of macular-anesthetic leprosy was made, and she was sent to Dr. Johns for findings. No bacilli were found. She was given the anthrax vaccine every four days, untill April 15, 1919, at which time, she appeared worse. The lesions were more inflamed and had apparently changed their morphology.

I did not see her again until February 3rd. 1921, when she applied for treatment for some trivial skin affection. Upon inquiry she told me that the leprous lesions had all vanished during the summer of 1919. She appeared well and on examination revealed absolutely no symptoms of her former disease.

In conclusion, I wish to say that the use of anthrax vaccine in leprosy is not original with me.

It was first suggested by Dr. Campos of the State of Columbia in South America, who in turn does not claim originality, but who does not disclose the name of the originator of the idea.

Whether the vaccine will cure all cases of leprosy, remains to be seen, but that it will cure some, I am certain.

DISCUSSION.

Dr. H. E. Menage, New Orleans: Dr. Roussel's paper is particularly interesting to me, but I had no idea from the preliminary remarks he made that he protected himself against a controversial argument so thoroughly as to make a discussion of it almost useless.

To go over the history of the cure of leprosy would be out of the question in five minutes. The main thing that occurs to me is to congratulate him on his attempt to cure this particularly horrible disease in any way whatever, even by the use of a club the size of the anthrax bacillus. He mentioned the report of two cases, and if I interpreted his remarks correctly, one case was positive from a bacillary standpoint. That case I will consider as a case of leprosy, unmistakable and proven, and any changes in the clinical characteristics of that case from any method of treatment are worthy of consideration. I also agree with him that in many cases of leprosy the organism cannot be demonstrated microscopically, and I feel as he does that although not proven microscopically the disease may be leprosy. On the other hand, I must feel that when we are using the word "apparent cure" in leprosy, we should have a true, proven, undoubted case of the disease, and not one that might have been leprosy from clinical judgment alone.

I realize that in the examination of many cases in the hospital and in private practice some of the cases we believe to be leprosy but cannot prove it. I also know there are other diseases that manifest and give clinically the skin symptoms of leprosy that can not be differentiated easily from leprosy, for instance the premytotic dermatitis of mycosis fungoides, Leukemia Cutis, etc., where even experts throw up their hands and much depends upon the microscope.

In regard to the second case, the organism was not found. I believe I understood the doctor correctly in making that statement. Therefore, the value of apparent cure in this case would be to my mind of much less importance because the positive identity of the disease had never been proven.

Again, it occurs to me that many cases of leprosy run a course not much different from the ones reported and appear clinically well in the course of time. We also agree with him that a great many drugs and many other measures will produce the same retrogression in the disease. Therefore, I believe the title of the paper is a little too strong and the word "cure" too promising at this time. If Dr. Roussel had stated that the disease had been arrested as many other similar types of disease have been arrested before, we might have agreed without discussion upon the results obtained.

I have in my hands a little pamphlet by McDonald from the Hawaiian Islands, and recently we have seen in the public press a report of 40 or 50 cases of leprosy apparently cured. These cases were examined microscopically to the limit, but the reports required the absence of the organism first or the presence of a degenerative type of organism showing that the organism is dying out. They further require a period of probation I think two years to determine whether the case would not relapse into active leprosy.

In the last dispatches a little girl is reported to have been cured. A search for the organism was made for hours and days. Every patch in the body was examined for the organism and was reported negative until in one patch in the skin the organism was found in great numbers. This case was taken out of the list and sent back to the hospital for further examination and study of the organism.

The paper although extremely important and interesting is so far as I can see a repetition of similar treatments for the disease

discussed for so many years pro and con and usually without definite results. It is my earnest prayer however that the Anthrax Bacillus tested by Dr. Roussel will prove not only an apparent cure but one which will forever be a blessing to the human race.

Dr. Ralph Hopkins, New Orleans: I think we have listened this morning to a paper that will mark an epoch in the treatment of leprosy if the apparent cures remain permanent cures. Some experience with the treatment of leprosy has made me rather hopeful of remedial measures that will provoke the sort of reaction that Dr. Roussel has described as following injections with the vaccine of anthrax. Improvement has been noted in reactions following the use of a number of different methods of procedure. In the first place, there exists in a normal case of leprosy certain periodic exacerbations of the disease accompanied by fever, sometimes the temperature being as high as 106, which is not unusual, and during the febrile period most of the macules and a great many of the nodules behave precisely as described by Dr. Roussel. We have noted a number of times that following this leprosy fever there has been a notable improvement in the condition. It seemed that agents, no matter what they were, which might provoke that sort of reaction, would in a sense break up or destroy the quiescence of the host to the invasion by the bacilli, because a chronic case of leprosy goes on for fifty or sixty years causing very little reaction, the host being quiescent. If anything can be done to break up the quiescence on the part of the host, the effect might be of great benefit to the individual.

A number of things we have tried at the Lepers' Home stirred up resistance on part of the individual, provoked a local reaction and produced systemic reactions with high fever. Among that list of remedial remedies we might include simple things like prolonged hot baths at a high temperature. Iodids internally administered almost unquestionably provoke a reaction.

Erysipelas has been a matter of common observation and almost always leaves the leper considerably better than he was before. I have had several cases that I thought proceeded to an apparent cure after vaccination with erysipelas vaccine. The erysipelas vaccine produces a local reaction and a high febrile reaction. The local reaction was followed by desquamation as profuse sometimes as the desquamation seen in scarlet fever, with the subsidence of the lesions, leaving pits where nodules had previously been. The method looked hopeful at times; I succeeded in one or two cases and failed in a considerable number of cases, and in the one or two cases in which I had succeeded they proceeded ultimately to relapse. These reports of cases treated with chaulmoogra oil esters makes the observation clear that most of the cases treated with the esters of chaulmoogra oil will react violently from time to time both locally and systemically. The observation is further made that after the local reaction there is considerable improvement progressing up to the point that Dr. Roussel has called apparently a cure.

Dr. J. N. Roussel, New Orleans (closing): As far as causing the lesions of Leprosy to disappear is concerned, I am sure it can be done in several ways. I have seen it done. I have done it myself time and again, but they do not stay "put," so to speak. They always return, and in much greater numbers. In the tubercular type, hypodermic injections of Bichloride of Mercury will do it. I tried the Bichloride at the suggestion of Croker, of London. Chlorate of Potash will do the same thing, and I have no doubt that there are other agents which will do it as well. These agents seem to loosen the organisms, and when the lesions recur, they are more numerous, and much more acute. Following the use

of the Ethyl-Esters of chalmoogra oil, the reaction has been most severe, so much so in some cases that I consider it almost a crime to use them. That the anthrax vaccine causes the complete disappearance of all of the lesions in some cases of leprosy, I am quite sure. Whether it will do it in all of the cases remains to be seen.

Man is not susceptible to anthrax. The number of people who get anthrax is not large. Man contracts anthrax on the principle that a blind hog finds an acorn once in a while.

As to the diagnosis of leprosy. It has been known since the time of Moses, and possibly long before, though I believe the first reference to it is in the second book of Moses, and since then we have been making diagnoses on clinical manifestations alone. People have been sent to leprosariums on these diagnoses and very rarely have been mistaken, and this was long before the bacillus of leprosy was known.

If we have mistaken our cases for premycotic dermatitis, as some one suggests, and the anthrax vaccine has cured them, we have discovered something equally remarkable as the cure of leprosy, because up to this time we have not been over-successful in the treatment of this disease, either.

GALL BLADDER DISEASE AND ITS TREATMENT.*

By Dr. A. L. LEVIN, New Orleans.

Why discuss a subject which is so frequently handled and supposedly so well known to all engaged in the practice of medicine and surgery? A great deal of ink has been spilled on elucidation of the abnormal function of the bile container, the effect of it on the human organism and the proper correction of the defect, but in spite of that we have not succeeded as yet to put this subject in the first group of things of modern medicine. In medicine of to-day, as in the philosophy of individual life, the data of the whole field can be divided into four distinct and separate clases, namely:

(1) Things we know. (2) Things we assume to know. (3) Things we believe. (4) Things of which we are wholly ignorant.

The recognition and treatment of biliary affections in the last eight years has been greatly modified and put on a more rational and scientific basis. The great designer of the human body, in putting in a side track and a reservoir for the bile, has evidently favored the surgeon more than the internist. But the surgeon, as Rehfuss puts it, has failed to answer for us the following problem: "Does drainage with or without

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cholecystectomy result in cure of the infection?" It is an everyday story in our clinical and private work, "My appendix has been removed, I did not improve; my gall bladder was drained, I felt just the same; the gall bladder was then taken out and I feel just as bad as ever before." What can be the internist's answer to such unfortunates who appeal for medical aid? The surgeon certainly deserves credit for the many wonderful cures, but what about those uncured? How can we decide in cases of gall bladder disease which shall be given first the benefit of a medical treatment and how to do it? This is the subject I am presenting for your consideration and judgment.

I will not deal in this paper with malignancy, the most painful and unsolved chapter in medicine and surgery, the fourth class, things of which we are wholly ignorant. My intention is to deal with gall bladder disease of a curable nature.

It will be of material aid to familiarize ourselves with a few anatomical and physiological facts, in order to have a clearer understanding of the subject. The newer conceptions of biliary affections, according to Rehfuss, are based on a better understanding of the position of the biliary tract, the gall bladder included, between the liver on one side and the intestines on the other. We must go back to physiology to realize what is happening in these important stations of the human machine. Contents from the intestines always bearing more or less infection are hourly traveling to the liver, the refinery so to speak. Out of this impure and more or less infected product, a substance called bile is created and flows down another tract known as biliary back to the intestines. It is like the puzzle of Samson, a nest of stinging bees in the body of the dead lion producing honey, but it contains waxy impurities. Does the bile flow into the intestines constantly unimpeded? No, the designer of the human body put valves in the cystic duct and at the outlet of the common duct, which act as double guards. Judging from this anatomical arrangement of the bile tract nature's plan was to allow an intermittent flow of bile into the intestines. Why? Probably for the simple reason that it is easier for the acid chyme in the duodenum to destroy smaller groups of bacteria coming down with the bile intermittently than a large number continually. There are other wise arrangements of a protective nature to

prevent the free entrance of infection from the intestines into the biliary tract, namely; the action of the sphincter of the diverticulum with a pressure within the common bile duct of 700 mm of water, according to Oggi, and the periodic free flow of bile keeping up a downward current, unless there is a stasis of bile and a mild reverse persistalsis exists. Physiology further teaches us that when food passes the pyloric gate and makes its appearance in the duodenum, the little bile gate in the diverticulum of Vater opens up, at the same time the gall bladder contracts and forces bile out through the cystic and common duct into the duodenum. When the latter is empty the bile gate at the outlet of the common duct closes and the liver bile, finding the outlet closed, is dammed up back into the gall bladder filling it up again.

Gall bladder disease is undoubtedly caused primarily by bacteria and is in my opinion a great and common factor in producing gastrointestinal disturbances. An attack of acute indigestion, without any definite cause, when the appendix can positively be ruled out, should put you on guard to suspect a beginning of gall bladder disturbances. To simplify matters, Cooke's definition is a logical one. He defines gall bladder disease as an inflammation of gall bladder with or without the presence of stones, in other words, he recognizes two distinct types—cholecystitis plus stones and cholecystitis minus stones. Osler's statement that in a majority of cases gall stones cause no symptoms and Hemmeter's contention that only 5% of all gall stone carriers ever have symptoms should not be taken for granted. Gall stones do not form in a perfectly normal gall bladder; whether we believe in the infectious theory of calculi formations, as Rosenow, or in the hypercholesterinemia, as adocated by Aschoff and Badmeister, structural changes in the gall bladder evidently take place which give rise to complaints of so-called indigestion, belching of gas, distress after meals, attacks of colicky pain, chilly feeling, a lump under the right costal arch, etc.

Routes Of Infection.—We are taught that the invading enemy comes either from within by direct ascension through the common bile-gates, through the circulatory avenues such as portal, systemic and lymphatic, or from without, the peritoneal side. Roesnow and others have demonstrated by laboratory experiments on dogs that streptococci from diseased

foci under tension, for example diseased tonsils, abscess at the root of teeth, diseased sinuses, etc., find their way into the circulation and attack the wall of the gall bladder, causing cholecystitis with or without stones. Streptococci, isolated from cultures made from diseased gallbladders in which all surface bacteria had been destroyed, produced cholecystitis and in many cases gallstones. If these experiments could be applied to every diseased gallbladder, proving the existence of infection and bacteria in the gall bladder wall, it would stand to reason that the removal of the gall bladder is a far safer procedure than depending on short-time drainage of the structure to cure the disease. Shall we accept this as a sine qua non? No, there is another view to this picture. It has been demonstrated that stones containing 100% Cholesterol are very common and that these are practically always bacteriologically sterile and the gall bladder shows little or no pathologic-anatomic change. This fact led to the new conception introduced by Aschoff and Badmeister in 1909 that the abnormalities in Cholesterol metabolism play an important part in the formation of gallstones. (Normal cholesterol and blood varies from 120 to 180mm per 100cc of blood, in bile from 0.4 to 0.7 per 100cc, of bile. Races with poor cholesterin are rich in stones, and physiological periods of increased cholesterin, such as pregnancy, are proofs to this theory; an excess of cholesterol in the blood may cause a precipitation of stones in the bile. Febrile conditions reduce cholesterol; diabetes, arterio-sclerosis, nephritis and inanition tend to increase it. Common duct obstruction by stones always causes an increase in cholesterol; gallstones in the bladder without obstruction may bring down the cholesterol to normal. The blood examination then is not of very great value, unless we have knowledge of the period when an increased cholecterol existed. According to this theory, it is immaterial whether the gall-bladder is drained or removed, trouble may arise afterwards, if the nature of the food tends to increase cholesterol.

These facts clear in our minds, we can realize the shortcomings of our old method of treatment. The old theory of purging is probably good in both varieties, infection and hypercholesterinemia, but it not sufficient, the alkine and antiseptic treatment may be helpful in one but not in the other; surgical successes and failures, in my mind, have a great deal

to do with the type of case under treatment, as I believe both theories are correct. This is why the treatment of gall bladder diseases should, is and will undergo a radical change from systemic to local, from empirical to specific.

Diagnosis of Biliary Disease.—With the establishment in recent years of the new method of tapping the bile exit region in the duodenum, the internist and surgeon are armed with a new weapon to make a more accurate diagnosis of biliary disease. It is no longer a question for the radiologist to decide and seal the diagnosis; the bile can and should be studied, as the gastric contents namely: chemically, microscopically and bacteriologically. We determine chemically the bile salts, such as cholésterol, bile pigment, urobilin, urobilinogen, calcium contents and viscosity; microscopically, we notice the presence of pus, blood, mucus and laminated cholesterol plates; bacteriologically—the presence of bacteria. The microscopical appearance of bile is often a determining factor and the doctor even in the remotest country, being deprived of laboratory facilities, can judge very well by the appearance of the bile; if it is not as clear and transparent as fine Wesson oil, the chances are that it is pathological, especially if a suspicious history of biliary disturbances goes with it. In a paper of mine recently published in the *New Orleans Medical & Surgical Journal* (Jan. 1921, Vol. 73, No. 7,) I have described the method of obtaining bile and gave a brief resume of its birth. It is needless then for me to waste time in describing it again. A few points relating to that method is in order.

The use of a gastro-duodenal catheter of my own design as described by me in a recent publication of the *Journal A. M. A.* is of greater advantage; the patient's general condition should not be conducive to pylorospasm, it is often necessary to prepare the patient with a dose of Atropin gr. 1/120, as advocated by Einhorn, or a dose of bromides given early in the morning. Introduce the catheter just long enough to reach the average pylorus—say about 22 in. from the lips or a little longer when using the nasal route; immediately after the introduction of the tube, instruct the patient to walk for about five or ten minutes, then put patient on back and massage the region of the stomach driving the catheter into the pylorus; compress then the region of the gallbladder forcing the little sac to contract while patient is taking deep inspiration. The main

points in my method is to drive the tube and not to depend on nature's generosity to send it in. Patients often lie for hours without any results waiting for nature's help; I repeat the statement that I made before that magnesium sulphate is not an essential factor in every case. If several efforts have proven futile, it is of significance to suspect a blocked common duct outlet by adhesion, inspissated mucus or stones. The quantity of bile obtained is sometimes very small in cases of contracted and small chronic gall bladders.

The numerous observations made by me and other workers in this field of endeavor, the diagnosis often confirmed by the surgeon, lead me to conclude that this method is of the greatest diagnostic importance to-day. I have also tried a method of oxygen insufflation with the tube in the duodenum in order to distend that region with gas, hoping to obtain a clearer view and a better outline of the channel radiologically. In doing this I have another point in view, after the bile and the inspissated mucus has been drained off, with oxygen in the duodenum giving us a darker shade on the plate, stones in the gall bladder will probably be more visible. In this work, I wish to express my gratitude to my confrere, Dr. A. Granger. We are not as yet prepared to make a report of the results obtained.

Treatment of Biliary Disease.—Whatever the origin of the disturbance might be, bacterial infection or an increase of cholesterol causing biliary stasis, common sense will teach us that by improving the drainage, we cause bacteria to be constantly washed out and cholesterol to be diminished. The treatment by this method can be divided into the following processes: (1) Simple drainage of the tract, (2) drainage plus local sterilization by various antiseptic solutions, such as argyrol, potas., permangan., silver nitrate, etc., (3) drainage, sterilization of duodenal tract plus transduodenal lavage. By the last named process, a double purpose is accomplished, namely: (a) the correction of a mild reverse peristalsis, (b) it minimizes considerably the infection in the portal circulation. Alvarez claims that the change in normal continuity and rhythm of bowel is the cause of aerophagia, heart-burn, globus and coated tongue. Rehfuss looks upon it as a very important modern principle in gastrointestinal pathology. (4) Continuous biliary drainage as long as 14 days, as described by Lyon. The bacteriologic phase of the treatment by obtaining the offending

organism and making autogenous vaccines, so ardently advocated by Rehfuss and Lyon, is a beautiful scientific vision. It is hardly possible to believe that he can sterilize an ocean of infection and catch at the bottom of it the causative organism. I admit it is undoubtedly a very useful method to determine the presence of typhoid organisms in the bile and classify the patient as a typhoid carrier.

A number of very interesting cases, before and after operation, could be cited which were treated with very satisfactory results by the method of bile drainage, but for the sake of brevity, I will submit the following table of a group of 90 cases under my observation for a period of 18 months:

Total number of duodenal taps for entire group	520
Cases treated by the above method	50
For diagnostic purposes only	40
Of the number treated no recurrence so far	30
Recurrence	13
Operated on	4
Refused operation	3

Of the group for diagnostic purposes only, the diagnosis in quite a number were confirmed by operation. One out of the 90, was proven by operation to be empyema of the gall bladder and full of stones. The diagnosis of empyema was made from the pure pus obtained with the tube. Several of them received 23 drainages before the bile changed from a dark molasses color to a typical Wesson oil appearance. Cases which do not improve in spite of persistent treatment are surgical. This is a point of diagnostic importance. In the number of cases with recurrence who were operated, a coexisting chronic appendix was found. In one case operated three times with recurrence of pain, the surgeon overlooked an existing achylia gastrica with an excessive amount of mucus in the stomach, and when that was corrected the pain disappeared. In one case, a coexisting systemic lues was found to be an important factor in keeping up the disturbance.

For lack of space and time, I will report only one case which I believe will be of great interest to all of us. It almost resembles a case reported recently by Lyon of chronic arthritis with lambliasis, with marked improvement by the biliary drainage method. In my case, there is only a polyarticular

arthritis, chronic, without intestinal parasites, the cause of the trouble seems to be undiscoverable, except that there is a very strong suspicion of an existing chronic cholecystitis, the drainage of which gave more relief than anything else used for a period of over two years The case in brief is as follows:

Mrs. A. M. A. age 48, white, female. In the summer of 1918, began to suffer with rheumatic pains in her feet and gradually developing also in her hands. In November 1918, she was admitted to the Touro Infirmary and kept in bed for 6 weeks; hot soda baths were used and oil every day; she complained of pains in chest, shortness of breath and rheumatic pains in arms and fingers. Also complained of some rectal trouble, dilatation was used for relief. Wassermann then was negative. Expert gynecologist eliminated any trouble in the pelvis as a primary focus of infection. In January 1919, all her teeth were extracted except 5 which were X-rayed 3 times and found negative. In March 1919, tonsillectomy was done, her hands at that time were very painful and swollen, no relief obtained.

In September 1919, autogenous vaccines were made from a blood culture and vaccine given every 4th or 5th day.

In November 1919, her hands and arms were badly swollen and feet very painful. She was put on thyroid extract. Wassermann again negative and several urinalyses negative. Gynecologist again reported negative. Her sinuses were then attacked with a view of finding the source of infection, without any results. They were found to be normal and to make sure, they were washed out and nothing was gained by it. About the same time she developed an abscess in the groin, which was treated properly and cleared up and since then, her left knee became swollen and stiff and contracted to an obtuse angle. She began to limp very badly and was compelled to stay in bed most of the time. The only relief she would get would be from a dose of calomel taken often. She became nauseated, started to vomit, could not retain any solid food. Milk and ice cream was all she could retain. Vertigo and dizziness would drive her back to bed every time she would make an attempt to walk. In June 1920, bile drainage was done in a sterile manner and an autogenous vaccine made again which was used for a period of 6 weeks, her condition became worse, she was too sick to sit up, she developed slight temperature and became very anemic. Xray of the gastrointestinal tract at that time was negative except for probable adhesions around the gall bladder area.

In August 1920, she went through a regular course of terrible treatment, as she describes it, in Hot Springs, with a slight relief for 2 weeks and following that short period of slight comfort, the condition became aggravated and assumed a more intense form than ever before. She returned to New Orleans and was under observation by one of our best orthopedic men, everything was tried, even intravenous injections without any results. She even tried yeast cakes every day, but nothing would move that hidden source of infection. She was again re-examined by a number of specialists and the focus of infection remained a mystery as ever before. Massage, violet rays, electricity and all sorts of suggestions were used in vain. She was referred to me with the idea of locating her focus of infection in the gall bladder and try biliary drainage. I undertook the task energetically and here I am presenting her before you after a 3 months treatment, wonderfully improved. She received altogether 23 irrigations, her bile

was exactly the color of strap molasses when I started and by the time we finished, it was a pretty, clear, golden yellow color. Microscopically, the bile showed colon infection, which I did not pay much attention to. I used Jutte solution at first, argyrol, posassium permanganate and then switched to the solution recommended by Ousley in cases of arthritis. During the course of treatment, she called in an orthopedic man to straighten her knee by Buck's extension. At present, she can use her hands very well, her gastric disturbance has disappeared entirely, she can eat a good meal, she has gained considerably in weight, and she hardly experiences any soreness anywhere in the body.

Bearing in mind the points I have dwelt upon in this paper and basing my opinion on a study of the 90 cases mentioned above, I come to the following conclusions:

(1) The surgeon should not be hasty in his decision to operate in cases of biliary disease unless he is dealing with restless stones, adhesions around the neck of the gall bladder or chronic recurrent attacks where a hopeless pathologic gall bladder is suspected.

(2) Biliary drainage should be carried on until there is an appreciable change in the original color of the bile.

(3) If a chronic appendix is coexisting, do not waste time on medical drainage, the trouble will recur.

(4) If the surgeon will operate only when indicated, as stated above the removal of gall bladder will be the operation of choice.

(5) Medical drainage of the gall bladder gives the quickest relief next to an opiate during an acute attack.

(6) Medical drainage gives relief from pain in cases of recurrence, after surgical drainage or removal of the gall bladder. If it does not, suspect calculi in the hepatic or the common duct.

(7) Do not overlook an existing achylia gastrica with an abundance of mucus or the coexistence of systemic lues.

(8) For diagnostic purposes, medical biliary drainage should always precede surgical.

(9) A cholesterol free diet should be prescribed whether the case is being treated medically or surgically.

(10) Empyema of the gall bladder is a rare condition. If pus is found in abundance through the tube, you are justified to suspect it.

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DISCUSSION.

Dr. J. B. Elliott, New Orleans: I want to congratulate Dr. Levin on his excellent work. It is a pleasure to see so much enthusiasm displayed in regard to this subject.

I usually classify my cases as bacterial, or chemical. Those are the only two scientific methods I consider, namely, bacterial or chemical. I wish to take up, first of all, catarrhal jaundice. These cases can be helped enormously by the drainage tube. Ordinarily cases of catarrhal jaundice should be put on small doses of epsom salts and a properly regulated diet. Never give calomel. I have given acid oleate of soda and salicylic acid for years and have had good results.

The second class is the infectious type of gall-bladder disease. In these cases there is sometimes jaundice, but more often no jaundice. There is nausea and pain radiating down the back. The temperature may range from 99.5 to 100. The leukocyte count is not up necessarily over 10,000. The neutrophiles are not very much increased. In such cases I resort to medical treatment. I first try to drain. If I cannot drain first, I put them on a carbohydrate diet, then give them acid oleate of sodium and salicylic acid. That is best for the treatment of cases of the non-suppurative type. If a patient should have a second or third attack, I regard it as a surgical case. If patients have recurrent attacks with fever, leukocytosis, from my standpoint I refuse to handle them as they belong to the surgeon. Being a medical man I would want cholecystectomy done, although surgeons I believe like to do cholecystostomy as well. I have seen more than one case of myocarditis due to the leaving in of a chronic gall-bladder. I want my patient with chronic gall-bladder disease to have the gall-bladder taken out.

I have had four cases such as the doctor spoke of, that were operated on for gall-stones six months ago, and they have come back to my office with the same kind of agonizing pain. One patient who has a stone in the common duct needed operation. A second case was a man who was operated on last October and his gall-bladder drained. He returned to my office on account of pain. He had not been put on a careful diet. He is attacked with the same pain. He needs medical treatment for a while, and if he should not improve, I shall advise him to have his gall-bladder taken out.

A third patient I saw only seven days ago, the patient being a man who had duodenal lavage. He was relieved at once of his trouble around the gall-bladder He was attacked in fourteen days with exactly the same pain in the same place. That man should be drained again, and drained two or three times if necessary. If he keeps on having these attacks, look out for that man's myocardium. I am afraid of chronic poisoning from that case, and I

should advise later on surgery. The majority of cases I see I certainly advise to be operated on by surgeons and have their gall-bladders taken out.

Dr. S. K. Simon, New Orleans: As soon as I read a paper on drainage of the gall-bladder by means of the duodenal tube by Lyon, in Atlantic City, I came back and put his methods into practice, and I have learned a great many things. I must confess that the pioneer work done in this field, led largely by Professor Max Einhorn, of New York, of introducing the duodenal tube and obtaining drippings of bile, the introduction of antiseptic solutions, such as argyrol, never impressed me, but Lyon's work was of such a high character and type, and his enthusiasm so unbounded, it certainly demanded a trial. I must say, I myself was skeptical as to the drainage of the gall-bladder by magnesium sulphate, but there is no longer any skepticism or doubt about it. The gall-bladder by means of magnesium sulphate can be made to empty itself of all accumulated bile, and not only that, but the entire gall tract is aspirated by means of the physiological action of magnesium sulphate in a thoroughly efficient manner. Any one who does this work in that manner, observing the effects of the magnesium sulphate, will not any longer doubt its efficiency.

In regard to getting the tube into the duodenum, it is a stumbling block. However, I am satisfied we are on the right track. The main point is having the patient swallow the tube after it reaches the stomach. You want to avoid the great curvature which the rapid introduction of the tube entails, and if it is introduced in this manner and by slow swallowing, it will take the lesser curvature route. After the tube is in the stomach and is resting against the lesser curvature, give the patient a glass or two of drinking water, and let him lie down or walk around. You follow the lesser curvature in this manner; the tube does not remain in the fundus of the stomach to be caught by the pylorus musculature, but it follows the line of the lesser curvature, and that is the route in introducing the duodenal tube, and the drinking of hot water facilitates carrying the tube along the lesser curvature and facilitates its ready passage into the duodenum. In some cases it is comparatively easy to introduce the tube into the duodenum, while other cases give more trouble. The mental element figures very largely. If you can get your patient's mind off of the introduction of the tube you can get in much quicker.

There is no controversy between medicine and surgery in this field. These cases are indicated for surgical drainage, but it does not cover the type of case in which the cholecystectomy is indicated. You cannot say this method will cure your case; you cannot see inside the gall-bladder any more than the surgeon can, and decide whether the gall-bladder should come out, or whether it is preferable to avoid the serious risk of removing the gall-bladder. All cases in which cholecystostomy is indicated can be very well approached by this method. Cases of gall-stones, cases of high infection of the biliary tract, especially of the gall-bladder itself, do not do well under this treatment. But nothing has been lost. No time has been wasted, and no danger has been incurred by resorting simply to drainage of the gall-bladder by the method we follow. The last case we had we subjected to at least ten drainage treatments used over a consecutive period of ten days, and repeated it again in two or three weeks, if indicated.

Dr. E. Denegre Martin, New Orleans: The subject has been so thoroughly discussed there is very little to say. In the beginning of this work I must confess I was skeptical, but I do know that there is more in this method of duodenal drainage by the tube than the majority of us are willing to admit. I believe the time is coming when we will be able to make a perfect diagnosis in a

given case. I can imagine, for instance, if we have a perfectly patulous gall-bladder, and this procedure is correct, we ought to be able to tell by the quantity of bile that is being poured out at the time as to the normal action of that gall-bladder. I believe in all these cases of slight infection, where there is slight gastric or gall-bladder disturbance, we can by this procedure relieve them. As has been said, if we find after reasonable drainage they are not getting the necessary relief, then we can resort to surgery. I am inclined to believe that where we have a mild infection and a patulous duct, we can cure these cases.

There is a class of cases which are infected where we have the leathery type of gall-bladder which goes perfectly with a patulous duct, yet empties itself all the time. These cases will keep on with chronic symptoms, can be cured by operation only. We want to be able to make a differential diagnosis in these cases and say whether or not these are really the cases to be treated radically.

With regard to after-pains, many of the postoperative symptoms which patients complain of are not due to imperfect drainage of the gall-bladder, nor to recurrence of the disease, but are due rather to adhesions which form after operation. We have these adhesions around the appendix; we have them in abdominal wounds, and why not have them here? In drainage cases, since I have been dropping the gall bladder to its normal position and not attaching it to the abdominal wall, my patients have done much better and rarely complain of after-symptoms.

I have learned another valuable lesson from this method and it is one of the most important things to be able to do without causing the patient unusual disturbance, that is to wash out the stomach after operation, where it must be done. Where we have regurgitation of bile into the stomach; when the patient is distended and even nauseated. In such cases this small tube can be passed through the nose and the stomach washed with little discomfort.

By introducing it through the nose and do away with all disagreeable features. There will be no nausea and no vomiting. The patient can be relieved without any trouble, and it can be left in over night. I am telling you this after having used it many times in these cases. Only a day or two ago I introduced this tube into the nose of a patient who was completely relieved after a second lavage. Lavage will relieve every case of pylorospasm, and if a man cannot be operated he can at least be relieved. If postoperative cholangitis cannot be relieved by drainage, the gall-bladder should be removed.

Dr. Allan Eustis, New Orleans: I think, like all new things in medicine, we are apt to be overenthusiastic in the use of the duodenal tube and I would sound a note of caution against the indiscriminate use of duodenal lavage, for the simple reason pointed out by Dr. Elliott, namely, that failure to drain the injected gall-bladder, may result in serious consequences to the patient. I know of one case of death which was directly traceable to duodenal lavage. A patient with a definite, septic gall-bladder consented to operation. During the interim of business preparation he had heard about the wonderful cures with the duodenal tube, although he had made arrangements for a cholecystectomy. After two weeks lavage he had another attack, with a leukocyte count of 35,000 and died of septicemia. I would caution practitioners not to become overenthusiastic.

In the treatment of gall-bladder disease we as medical men should watch the work of different surgeons. The best results I have seen in these cases have been from men who have been conservative in their surgical technic. These men make it a habit in cases in which there is empyema of the gall-bladder of

not attempting to remove the gall-bladder at the first sitting but simply drained it, thus allowing the infection to become less virulent, and going back at a later stage and removing the gall-bladder when the infection is not so virulent. The reason for that is, after removal of the gall-bladder there is a marked contraction of the ampulla of Vater, with stasis in the common duct. If that material is infected you will have a secondary pancreatitis, and by drainage of the gall-bladder for several weeks or months there is less chance of subsequent pancreatitis.

Dr. C. W. Duval, New Orleans: It is not clear how any one can enter the gall-bladder or biliary passages by the introduction of the duodenal tube. We all know that magnesium sulphate given to an individual will cause the emptying of the gall-bladder. We also know you may pass a tube down into the duodenum, and manipulate it all you please, and roll the patient over, and it will not have any effect on the gall-bladder. At least, it will not empty. You may drain out the gall-bladder with the tube if you will precede its introduction by magnesium sulphate, then you are simply draining the duodenum or taking some of the material that has come from the gall-bladder into the duodenum, but you will not accomplish this except through a tube below. The cystic duct here is supplied with valves, and they all point in the direction of the fundus.

I understood Dr. Levin and Dr. Martin to say that after introducing the tube you must consider the abdominal wall; that you can feel the gall-bladder and squeeze the bile out of it. You cannot do it to save your life, because these valve close tighter and tighter. You have got to open these valves through the stimulation of chyme which passes out of the stomach. Magnesium sulphate will do the same thing. To get these valves to open you must act upon the mucous membrane through the nerve by something like chyme or magnesium sulphate.

Dr. J. E. Knighton, Shreveport: I have had occasion during the past year to have considerable experience with biliary drainage with the duodenal tube. With reference to the kind of tube one uses and the difficulty of reaching the duodenum, I will say that it has not been a great problem with me. The fact is, with the tube that was first designed by Einhorn, I have been able to reach the duodenum within thirteen minutes. Unquestionably, when you are able to get bile drainage, or if you are not able to do so, the bile ducts can be drained by aspiration with a syringe. Have the patient drink water, and if you are not able to draw the water back immediately you know the tube is beyond the stomach. It is not a difficult problem so far as having the tube reach the duodenum is concerned.

The question in my mind is as to the value of this method before us. As Dr. Eustis pointed out, we must not permit ourselves to become overenthusiastic and attempt to treat every case of gall-bladder disease by means of this tube and drainage. There is no question in my mind but that there is a class of cases which under proper treatment can be taken care of by this means. There are other cases in which we should not attempt to continue the treatment by means of this tube. It is of value in diagnosis. It is of value in determining whether or not you really have a diseased condition of the biliary passages. It is of value in continuing at intervals drainage of the biliary passages after you have had surgical treatment for drainage of the gall-bladder. The trouble about a great many of these cases that are drained surgically is that the drainage is not continued long enough, and occasionally drainage by means of the tube afterward will be of great benefit to the patient. We frequently see patients who have had surgical drainage, and after a while they complain of the same symptoms,

and drainage of this type relieves them, and it can be demeonstrated beyond all doubt that it causes drainage of the gall-bladder passages.

Dr. Daniel N. Silverman, New Orleans: It may be said that we occasionally meet with difficulties in the introduction of the tube into the duodenum and as long a period as twenty-four hours may elapse before intubation takes place.

The gall-bladder being relaxed and the ampulla closed in the fasting state in which we have our patient during this examination, it is generally believed that some substance such as magnesium sulphate must be introduced in order to dilate Oddi's muscle. Should drainage be obtained with the mere introduction of the tube, there is little doubt but that we are dealing with a disturbance in the nervous innervation or some pathological state such as adhesions causing a patient sphincter. Certainly, in order to facilitate drainage of bile, the salt should be added in all cases.

In the treatment of some of these cases of pyogenic infection of the gall-bladder, we should not depend upon the subsidence alone as a guide to improvement. Although the patient may feel much better after a few drainages, one will often find that the bile remains full of leucocytes. Many of this type are surgical and can be relieved of a deep seated focus of infection by this means.

Relative to hypercholesterolemia, a possible cause of stone formation, Rehfuss says that infection is considered by many to play the predominating role in this change. We always have infection and usually stasis before cholelithiasis whether there is a predisposing hypercholesterolemia or not.

Dr. J. A. Dana, New Orleans: I want to thank Dr. Elliott for his clear classification of the cases which are surgical and those which are medical, and the time when a medical case becomes a surgical one. I could not have stated the case more clearly than the doctor did. I agree with the medical men from a surgical standpoint that there can be no question about introducing the duodenal tube as indicated. Gastroenterologists have demonstrated it clearly.

I want to take exception to one remark made by Dr. Duval of not being able to squeeze the gall-bladder because there are valves in the cystic duct. There may be anatomically valves in the cystic duct, but we surgeons know that one of the common tests we make regarding the patulousness of the cystic duct is that when we open the abdomen and expose the gall-bladder, especially if it is tense and bulging, we are able to squeeze bile out, and unless there is a pathologic condition we can usually empty the gall-bladder without any trouble.

Dr. A. L. Levin, New Orleans (closing): I am not going to occupy much of your time with any closing remarks. I wish to thank the gentlemen for discussing my paper so thoroughly. I will repeat what I have previously said, that at the Congress of American Physicians held in Baltimore recently this was the most interesting subject discussed.

Dr. Duval should not mislead you because of his high standing as a pathologist. The practical application of this method of treatment does not harmonize with his theory. We see and make use of it every day, and if he wants to see how this is done I will have cases to demonstrate tomorrow at 8 o'clock in my office, at which time I shall be glad to show him how we can drain for hours and empty the bile from the common and hepatic ducts and probably also from the liver. The results speak for its usefulness.

With reference to the remarks of Dr. Simon, I do not agree with him, that the tube mysteriously follows the lesser curvature.

I suggested and designed a new tube, because I believe this tube will enter the duodenum quicker and drain better. There is no need for metal at the end of the tube.

As regards the remarks of Dr. Silverman concerning gall-bladder disease, if he will look up the subject in some of our recent works, he will find it plainly stated that hypercholesterinemia without infection does cause gall-stones, but the infection follows afterwards.

DRUG ADDICTION AND ITS RELATION TO PUBLIC HEALTH.*

By Dr. M. W. SWORDS, New Orleans.

I will not undertake a discussion of this subject as the time allotted me is not sufficient to give it the consideration that it deserves. Instead, will merely call to the attention of this Society the importance of this matter, in order that they may discuss it.

Drug addicition is a burning issue all over the civilized world and when an opinion is expressed thereon, it should be after careful study and deliberation. Many are the thousands whose happiness and liberation from slavery depend upon the future acts of the medical profession. Continuous use of opium, or its derivatives, for a sufficient length of time, (necessarily varying in different individuals), produces what is called the opium habit. Cocaine does not produce the same effect as opium or its derivatives. The use of cocaine is a vicious practice and must not be confounded with opium addiction. The so-called morphine habit, in my opinion, is not a habit at all, but a diseased condition definite as to symptomatology, physiology and pathology.

Medical opinion is about equally divided on the subject of drug addiction into two classes. One that addiction is a vice, pure and simple, and that the victims are vicious individuals. The other, that addiction when once thoroughly established is a disease, no matter how contracted—preferred or accidental.

I believe with those that contend that the continuous use of opium or its derivatives produces a diseased condition in the user with manifestations of symptoms that is always true in kind and character in every individual user, regardless of condition, race, sex, age, occupation, custom or habit.

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Withdrawal symptoms of morphinism is as distinct in characteristics as any disease that we know. Experimenation by Volante and others has demonstrated that animals when treated by continuous doses of morphine develop the identical phenomena as those found in the individual user of the drug. Volante was able to immunize dogs and other animals from toxic doses of morphine by injecting the serum of an addicted animal into the blood stream of a non-addicted animal. If the truth of this experiment is to be accepted, it absolutely lays at rest the importance placed upon the psychology of drug addiction.

The belief of the penalogical experts that addicts are mostly criminals, and that opium users are chiefly of this class, to my mind, is only the expression of an opinion that has no justification scientifically, and is not based on common reasoning. Addiction disease bears the same relation to public health as other diseases that are considered in their particular class. The treatment accorded the addict at present is inhumane, and the medical profession should take immediate steps to put an end to the fallacious opinions existing, as regards the drug addict's station in life.

Legal regulation of the addict that prevents his obtaining a drug that has become a physiological necessity except through illegitimate channels and from irresponsible sources causing untold misery, suffering and death, and is extended through these sufferers to thousands of innocent people dependent upon them for their daily succor, should be either repealed or modified in order that this deplorable condition would no longer be tolerated under the law.

Treatment, care and the final solution of this problem is a scientific one and should be far removed from legal regulation and penalogical methods; especially when the so-called penalogical expert and policeman are substituted for the physician; where prisons and the like institutions are made use of instead of institutions of science.

Drug addicts are not criminals and should not be classed as such. There are criminals that are addicts; so are there ministers, lawyers, doctors, and bankers. Therefore, addiction recognizes no social law.

This is a matter that we medical men must solve. It is time for the drug addict to be recognized as a sick individual;

it is time for the doctor of medicine to recognize him as a sick individual; it is time for the doctor of medicine to treat this sick individual by the same scientific methods employed in the treatment of other diseases. This is a condition that must be disposed of, and when it is, it will so be by medical men of the universe and not by penalogical experts and legal regulations.

DISCUSSION.

Dr. W. H. Seemann, New Orleans: I did not intend to discsus this paper, but inasmuch as it has been prepared so thoroughly by a man who has had so much experience in the treatment of drug addiction, it should not go without discussion.

I represented the Louisiana State Medical Society on a committee to study drug addiction. We gave a great deal of time and thought to the subject, but we did not arrive at exactly the same conclusions that Dr. Swords has arrived at, although our experience, our intimate contact with these individuals did not compare in any way to the vast experience Dr. Swords has had.

The general opinion among the men on the committee, many of whom had have considerable experience, was that in the majority of instances the drug addicts were vicious. They admitted that there were some few, or a small minority, but through force of circumstances, through disease, or for some other reason, they had become addicted to the use of morphine or of opium, or one of the other derivatives of opium, and they had become so accustomed to it they were actually in a diseased condition. When I say we differ with Dr. Swords, we differ from him only in some particulars, not entirely. I personally feel, after studying this condition, that I am less able now to express a positive opinion than I was early in my investigations. It seems to me, the further you go into the subject the more ramification you encounter and you find yourself in a sea of doubt, unable to express an opinion or to know in which direction to go. It is unfortunate that something could not have been done by the Federal Government when they enacted the narcotic law to take care of these addicts thrown upon the community. This matter is of considerable sociologic importance, and from the standpoint of criminology it offers probably one of the most vexed questions to solve that the penalogists have to deal with. I am sure we all know the enthusiasm with which Dr. Swords has gone into this work, and we feel his views are based on an honest opinion after a considerable experience, and no matter what our decision is, we must all recognize the fact that he has thrown every force of his enthusiasm and vigor in the attempt to solve what has been and what will always be a very vexed problem.

Dr. E. M. Connely, New Orleans: I would like to ask Dr. Swords if in his experience he has run into the criminal class, and that most of them come from the demi-monde, and if they are not, most of them, more or less subnormal intellectually. In other words, do they not come mostly from a class that the phychiatrists call constitutional psychopaths.

Dr. W. J. Otis, New Orleans: My experience with this class of patients is that the sooner we get them, the more isolation we give them, the quicker the withdrawal of the drug, and the more forced feeding, the better the results. In order to contribute to the recovery of these people, we must have isolation, and to do

that we must have co-operation of the state and city officials. To do it thoroughly and properly we must have a psychopathic pavillion with experts in charge. Some of these people we know are quite intellectual under the stimulus of the drug, while others are not. The majority of cases I have had to contend with have been subnormal to a large extent, pathologically so. Even though they were keen and acute along certain lines, their intelligence level was below par in a large number of cases. The majority of these cases, as we all know, are antisocial. A number of them are moral imbeciles, psychopaths, and inadequate personalities

From my experience with these people in all walks of life, male and female, they are just as I have said in opening my discussion. The measures to be invoked for their treatment are isolation, proper scientific treatment, forced feeding. All with the hope of a recovery.

Dr. W. M. Swords, New Orleans (closing): Dr. Seemann made the statement that all members of the committee that was appointed do not agree thoroughly with all my views, and that is something that is common to the whole country at present. Doctors are arrayed against one another. They are about equally divided as expressed in my paper. We do not know where we are, but we do know that we are dealing with a matter that is of the utmost practical importance. In these United States there are two millions to four millions of these people that have no place to go, no place to be treated, no place to be comforted except in jail, and they do not want them there.

My fight for the addict has never been based on anything that is curative. I have had no experience with the cure of addicts. I have never treated an addict in my life, but I do believe that if you have these people to contend with, no matter whether they are psychopaths, whether they are below par or above normal, it makes no difference what their mental attitude or physical condition may be, they are still Christian human souls, and many thousands of them are not responsible for their condition. This is one of the instances where you should be your brother's keeper, no matter what condition in life a man or woman may be, whether from the demi-monde walks of life or not. Whenever a man or woman reaches a position in life that he falls by the wayside and continues to fall until he reaches the bottomless pits of hell, naturally we should strive to keep him from being pushed farther down in the mire of perdition, and it is in these cases that we should be our brother's keepers and extend a helping hand to the individual and try at least to give him some comfort and some relief other than serving thirty days in jail under very bad conditions. I do believe it is better to make social assets and possibly honest citizens out of individuals that are compelled to resort to theft and other crimes to obtain the drug that they will and must have. If you do not supply them with this drug legitimately, they will obtain it illegitimately.

I agree with any one that will do anything to help these individuals. Why are they addicts? The United States Government in its congressional record in the statistics tabulated from all parts of the United States gives two great causes of addiction. the environment of the tenderloin districts and association, and doctors of medicine. The government report says that. That being the case, if this is a vice, why should the government spend so much money to treat venereal diseases, which is a vice pure and simple, and yet close every avenue to these suffering unfortunates of humanity from obtaining something they must have and will get. That is the interest I have in drug addiction. I agree with anybody to do anything in the world for the addict and his family

that will better his condition, but I agree with no one who says we should throw these irresponsible individuals out to prey on the public, or to be taken by a policeman and made a prisoner. The jail is no place for such a person. We should treat such a man as we should treat any other individual who is sick, it makes no difference what his station in life may be. That is my interest in drug addiction. It is more from a sociological than a medical point of view. As I have said, I have never treated one of these addicts and never expect to. Gentlemen, let us not throw the addict back into the scums of the city. Let us provide something for him so that he can be isolated and properly cared for. Let us do it quick, They have closed every avenue to these unfortunate beings and have done absolutely nothing for their welfare.

THE NEGLECTED TEETH OF CHILDREN.

By J. ROSS SNYDER, M. D., Birmingham, Alabama.

The attention of the profesison has been frequently and forcibly called to conditions of ill health resulting from diseased teeth and gums. At this time it may be stated that both the dental and the medical professions are keenly awake to the many possible dangers and injuries to health, resulting from this source. Indeed more conservative men assert that there now exists an unwholesome tendency to too quick conviction and sacrifice of teeth. The writer has little sympathy with this view. He believes that for every tooth which has been unnecessarily sacrificed there still remain a hundred teeth which ought to be pulled. It must be admitted, however, that the warnings and the admonishments of the conservative elements in the profession have given a helpful stimulation to prophylactic endeavors. There now exists in every city of size a number of dentists who are specializing and even limiting their work to prophylaxis. As people become more educated in the importance of dental hygiene and in the dangers of dental diseases, the number of these specialists will increase. The dental needs of our adult population are even now being looked after in a fairly satisfactory manner. The same cannot be claimed for our juvenile population. Ignorance, indifference and neglect continue to characterize our care of children's mouths. For a number of years such men and women as Fones, Thomas and Maud Tanner have been urging upon the professions consideration of the dental rights of children. In the communities in which they live, these men and women

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have done much to extend enlightenment on this matter to the general public. Their influence indeed has been national, so that now the programs of boards of health in a few progressive states such as Tennessee, North Carolina, Vermont, New York and probably one or two others, include a propaganda of dental hygiene for children. Notwithstanding these encouraging evidences of progress, the fact remains that, taking our great country as a whole, the children therein still suffer neglect of their dental rights at the hands of an indifferent people. The chief blame and responsibility for this neglect rest on the dental and the medical professions.

Wherever there has been made a systematic dental inspection of school children, startling and deplorable conditions have been revealed. In spite of the wide publicity which has been given to these findings, in spite of very brilliant results, which have followed every intelligent effort to combat these conditions, the great body of our professions continues in a disappointing attitude of *laisser faire*. The economic loss incurred by the state in educating children made backward by diseased teeth has been calculated in figures which ought to appeal strongly to statesmen. The number of children in this country with foul teeth and gums is legion. All such children are below standard and to this extent all of them are sick. Some of them are sicker than others. Malnutrition, indigestion, anemia, backwardness, pyelitis, nephritis, incorrigibility and insanity are a few of the many conditions which singly or in combination may have their sole origin in diseased teeth or gums. In an age when commercialism seems to be spreading in our professions, it is regrettable that the humiliation and the pain and the ache and the weariness and the expressed and the unexpressed suffering of little children with these conditions are incalculable—if they could be put in figures there might be a quicker arousing.

Before coming here the writer was advised to be careful not to make assertions hard to prove. When a thing is common knowledge it needs no further proof. There are children in remote rural districts of some states who are receiving more intelligent care than the children of Birmingham and of New Orleans. With but few exceptions the children, both of the rich and of the poor, of these cities are being denied proper dental care. Their teeth are allowed to come and to go with

but scant if any attention, and this too while they are surrounded by dentists and physicians who are ranked high in professional attainments. To me it would seem a wise and a philanthropic move on the part of the United States Public Health Service to send Dental Hygiene Units, not into the recesses and the mountains of West Virginia but into our largest cities, that the professions might be educated. I feel no hesitancy, or delicacy for that matter, in asserting that any girl graduate after a year's course in the Bridgeport or the Boston or the Rochester Dental Hygiene School, could, on coming to Birmingham or New Orleans, teach many men in the dental and the medical professions much which they should know. I have no way of judging the knowledge of the men in these cities except by the way in which their work displays it. I have seen into the mouths of many children in this and in my own city; precious few of them exhibit anything to indicate that there exists here or there any very broad knowledge of dental hygiene.

This knowledge is accessible to all. Many of you no doubt have it, but of what worth is it if you don't show it? Some of you may even be proud of the good dental care which is given to children in your own clientele but whether you know them personally or not, each of you shares in the responsibility, for the general neglect of the hundreds and thousands of children here who because their teeth are only temporary, are allowed to "shed" them when and how they can. Each in measure is responsible for the health which too is "shed" during this a process of "'shedding" teeth

The men who have no knowledge of the importance of dental hygiene are probably not in attendance at this meeting. They seldom go to meetings. They are hard to reach. I am getting at them in a new way which is related with the hope that you too will join me in a crusade against their ignorance. Whether it be from laziness or a too close application to the demands of a large practice, the dentist or the physician who fails to keep himself posted by study, by reading and by attending meetings and clinics, is incapable, if you will permit the vernacular, of delivering the goods. If he can't deliver what he professes to have, he is just as much a cheat, just as much a crook, just as dishonest as is the grocer who gives

short weight. Any code of ethics which protects from exposure him, who is neither a good doctor nor a good citizen, is not ethics at all but insidious lying. Habit is a hard thing to break. I continue at times to lie for some of my medical confreres, just as I expect them to do for me on occasions, but I've sworn off so far as my dental friends are concerned.

There was a time when I was willing to argue in an effort to persuade dentists to be so kind as to give proper attention to my little patients. Time and time again do I refer children to their family dentists only to have the latter refuse to do the work which is needed—refuse on the old, old ground that the temporary teeth of children ought to be let alone. If I didn't know any more about pediatrics than some of these dentists know about teeth, I would go to the wilds of Africa—to tie umbilical cords of nigger babies for a profession. My lot was a hard one until the advent into my community of several dentists who agree that bad teeth are none the less bad because they are temporary and that bad temporary teeth often leave behind permanent injuries to the child's health. Just now I am having a lot of fun at the expense of the dental Bourbons. I still refer my little patients to the family dentist, I am still willing to give him a chance. But if the parent returns to report an unwillingness on the family dentist's part to interfere with nature, I tell her something like this: "You have been unfortunate in selecting a dentist even rottener than your child's teeth, let me send you now to an up-to-date man." I have made a number of very enjoyable enemies and I recommend this system to any of you who wish for amusement which will do some good.

Before closing this brief but probably too frank paper, I wish too to ask your co-operation in an attempt to educate a body of men much closer to us than the dentists. I refer to the throat surgeons, than whom with their tonsilectomies there are none in our town exercising such a pleasing graft. My protest, however, is not directed so much against the ridiculously large fee which is being collected for a comparatively simple and easy operation but at something more serious. Many of these men in their desire to be known as strict specialists will see nothing in front nor behind the throat. They see nothing and they know nothing except tonsils, adenoids and fees.

Such have been allowed to run loose long enough. We ought to start in on them by teaching them that the child's teeth can harbor debris and pus to cause trouble just as much as is caused by diseased tonsils. The surgeon who removes tonsils from a child ever so completely and bloodlessly and yet leaves go unnoticed a decayed and foul tooth, ought to be known for just what he is—*a bum operator.*

DISCUSSION.

Dr. Haidee Guthrie, New Orleans: It is quite an honor to be able to stand before you and discuss some of the things mentioned by Dr. Snyder in his paper. I thoroughly agree with him that both dentists and physicians are exceedingly lax in the care of the child's mouth, not because we are ignorant of mouth conditions, but because the majority of operators are afraid of the child. A mother will bring her child to a dentist with the child's jaw very much swollen. She will walk up and down the office, and tell you how terribly nervous the child is. It is not usually the child who is nervous, it is the mother.

I have had over 4,000 cases of children under the ninth year in New Orleans, and the greatest amount of success we get with our children is in prevention. We should teach the young women in our high schools, the imperative necessity of the care of the teeth, so that when they become mothers they will know what to do for their children.

I find that 98 per cent. of the children have defective teeth; that 99 per cent. of them have no tooth brushes. In families of six or eight sometimes there is but one tooth brush for the mother, father and all the children, but thank God, for the one brush as it shows we are doing something in prophylaxis. One reason we do not see conditions in the mouth of the child is because all of us have had abscesses and no records of examinations that were made of these cases have been kept. I have not seen acute abscesses in the mouths of children. At the beginning of the third year there is absorption of the roots of the decidious teeth, the pre-molars particularly. On account of the peridental membrane and the lack of elastic tissue proper, the pus immediately finds an exit. In the case of a chronic abscess there is no pain on percussion, so that when we see pus and sinuses in the mouth of the child the abscess is chronic, and nearly every one of the involved teeth have to be extracted.

One rule is, if you cannot fill the tooth of a child, that tooth must be extracted. I would like Dr. Snyder to come into my clinic. I feel sure that he will find cleaner mouths in some of my children than can be found among many people seen in private practice.

A few years ago I selected fifty children in the Day Nursery and with the co-operation of welfare workers, in examining the children's mouths every six or eight weeks apart for two years, that is, children between the ages of two and four years, I could not find a cavity. I did not select children with the most perfect dentures, but the first fifty that came in were selected. If we could do that for the children in our slums, we can do it for children in our private practice. You physicians see these cases oftener than we dentists do, and when the child has its first tooth, it should be brushed. We need the co-operation of the physician

as the physician needs that of the dentist, and I am going to ask all of you when you see a tooth to please urge the mothers to use a tooth brush and put it on the tissues. The soft tissues need as much attention as the teeth of the child.

In our slum district we see ulcerative stomatitis. A good many of the men overseas called it "trench mouth" and treated it as such. In three hundred of these cases we have used dichloramin-T solution with gratifying results.

Dr. L. R. DeBuys, New Orleans: I want to repeat one of the statements that Dr. Guthrie made with regard to the attention given the first tooth. The question is frequently asked us, "Doctor, when should we begin this dental hygiene?" It should begin as soon as the first tooth erupts, and the first tooth should receive as much attention as the last tooth.

There is a close relationship between infected tonsils and infected teeth, and it can be readily understood and seen how a mouth bathed in pus from bad teeth can infect tonsils.

An interesting fact that came to my mind about two months ago was that there are dentists now specializing in the dentistry of children. There was one of these dentists here from Minneapolis whom I met and with whom I had the pleasure of exchanging views, whose dental work is entirely and exclusively limited to children.

Finally, I want to say that in those mouths where chronic dental defects exist we are apt to find elevated mouth temperatures, so that in recording temperatures of children with bad oral hygiene, these temperatures are frequently misleading. In these cases we should emphasize the necessity of the rectal temperature.

Dr. F. C. Ewing, Alexandria: I want to thank Dr. Snyder for his reference to the tonsil. For over twenty-five years I have been engaged in the specialty of the ear, nose and throat, and for the last two years I have practically been in the service of the United States Government at the Public Health Hospital in Alexandria.

Long ago I read John Noland Mackenzie's article on "The Slaughter of the Tonsils." I think it was away back in 1913. Mackenzie is Professor of Laryngology in Johns Hopkins University, and is one of the most brilliant and classical writers in America. He inveighed against and put his foot down in vigorous language on the so-called iniquitous tonsil. For intance, he says that the tonsils are much more often infected by the sinuses than the sinuses by the tonsils.

I simply quote him as authority who takes issue with the modern idea that all tonsils should be removed. I have argued with my friend Sluder of St. Louis on this subject, he is one of the ablest men in America who has done original work on the sinuses and spheno-maxillary departments of laryngology, and is a professor in Washington University in St. Louis. He believes that all tonsils should be removed. I believe a tonsil can be terrifically infectious, but we should exercise some conservatism about its removal. I have not gotten such brilliant results from taking out tonsils as a great many specialists claim. We have had as many as fourteen cases in a day since I have been at the Base Hospital, and now we have 550 patients, and we are taking out three or four tonsils a day, but the removal of these tonsils has not shown the brilliant results reported by so many practitioners.

As to the teeth, you may appeal to the decency of people, and as a matter of cosmetic decency they should clean their teeth twice a day. It is hygienic decency for you to tell your mother to clean her children's teeth.

I have not much faith in nor sympathy with ready-made specialism. A young man graduating from a medical college at once be-

comes a specialist. He ought to have a course of years in general medecine before taking up a specialty.

Dr. J. Ross Snyder, Birmingham:, Alabama (closing): As no one has disagreed with me sufficiently to get up an argument, I suppose I had better let well enough alone.

NERVE BLOCKING ANESTHESIA.*

By WM. JOHNSON, M. D., New Orleans.

Almost as old as medicine itself is the desire to render surgical operation painless through the medium of the local anesthetic. History reveals the fact that local means of producing analgesia dates back prior to the time of the employment of drugs for general anesthesia, yet the practical application of the general, precedes that of the local, by many years. The history of the efforts of those men who have given their lives in the furtherance of their desire to control pain, is one of the most interesting chapters in medical literature.

Cold applications and pressure were used to lessen pain when operating centuries ago. The Assyrians compressed the carotids of the neck. The local anesthetic effect produced by mandragora was recognized early by the Chinese. The Greeks made ointments and various concoctions from plants and employed them for their sedative and analgesic properties. We are told that following the death of Adonis, Aphrodite threw herself upon a bed of mandragora and lettuce, in order to relieve the feelings of grief. Indian hemp was used by the Egyptians, and it is stated that the plant mandragora was used twenty-five hundred years before Christ by the Egyptians, Hebrews, Hindus and Chinese. The application of cold was used as an anesthetic by Seberinus in the 16th century and revived again during the Napoleonic Wars. In 1850 Arnote and Hunter, following out this idea, applied freezing mixtures. Richardson invented the ether spray in 1886.

Morphine was the first drug to be injected in the region of the nerve trunks during the many experiments following the invention of the hypodermic syringe by Rendo and Wood in 1853. Finally, in 1884, Kaller introduced cocaine in operations on the eye, throat and larynx. This, with the isolation by Takamine in the year of 1901 of suprarenal extract which made

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the use of cocaine less toxic, marked the beginning of modern local anesthesia. Then finally, other preparations were developed, namely procaine, and the technic improved until it is now possible to block various nerve trunks located in almost any part of the body.

The term anesthesia is applied to the loss of all sensation either local or general. Analgesia to freedom from pain, consciousness being retained. Nerve blocking is really a local analgesic and is particularly attractive to the head surgeon because of the accessibility of the nerve trunks, the possibility of the dry field, and the assistance of the conscious but comfortable patient.

The fundamental basis of the nerve blocking implies a thorough knowledge of nervous anatomy, of the surrounding anatomic structures, of the bones located in the region of the various nerve branches.

Procaine is the preparation par excellence, according to the latest reports of the National Committee on anesthetics, and the many surgeons who are doing nerve blocking. When large quantities of the analgesic agent is to be used as in the block method, the question of the vehicle is very important. Ringer's solution being isotonic with the blood is employed almost exclusivey.

Anatomy.—The nasal septum is a thin vertical wall which separates the nasal fossa from one another. It is formed in front, by the crest of the nasal bones and nasal spine of the frontal; in the middle by the perpendicular plate of the ethmoid; behind, by the vomer, rostrum and ethmoidal crest of the sphenoid; below, by the crests of the superior maxillary and palate bones. It presents, in front, a large, triangular notch, which receives the triangular cartilage of the nose; and behind the guttaral edge of the vomer.

The cartilage of the septum is somewhat quadrilateral in form thicker at its margin than at its center and completes the separation between the nasal fossa in front. Its anterior margin, thickest above is connected from above downward with the nasal bones the anterior margin of the (2) upper lateral cartilages, and the inner portion of the (2) lower cartilages. Its posterior margin is connected with the perpendicular lamella of the ethmoid, its inferior margin with the vomer and the palate processes of the

superior maxillary bones. These various cartilages are connected to each other and to the bones by a tough fibrous membrane which allows the utmost facility of movement between them.

Block anesthesia for operations on the nasal septum (and turbinate bones, the nerve supply of which is chiefly the nasopalatine branch given off by the spheno palatine ganglion. These nerves, right and left, supply the central and lower and posterior portions of the septum, the Anterior being supplied by the medial branch of the nasociliary nerve which is derived from the Ophthalmic division of the fifth nerve.

The lateral nasal wall derives its nerve supply as follows: The upper posterior portion of the lateral nasal wall, from the posterior superior lateral nasal branches derived from the sphenopalatine ganglion; the lower posterior portion is supplied by the posterior inferior lateral nasal branch derived from the anterior palatine nerve; the anterior superior portion is supplied by the lateral nasal branch from the nasociliary nerve; the anterior inferior portion of the lateral wall, including the floor and anterior part of the inferior meatus are supplied by a nasal branch derived from the anterior superior dental.

The technic for blocking nerve supplying nasal septum.—The first injections made are the blocking of the right and left sphenopalatine (Meckel's) ganglion, which anesthetizes all branches supplying the nasal septum with the exception of the medial branch of the nasociliary.

Technic for Blocking the Sphenopalatine (Meckel's) Ganglion and its Branches.—The mucous membrane distal to the upper third molar, or in other words, distal to the tuberosity of the superior maxillary bone is carefully wiped with gauze so as to remove as nearly as possible oral secretions, and 3½% iodine is applied. A syringe carrying a Smith hub and needle is held in the hand pen fashion, the needle is inserted into the mucous membrane, advanced upward, inward and backward to an approximate depth of 2½ cm. for adults or 1½ cm. for children. 4 mils of a 1 per cent is injected; with children 2½ mils. When the solution is injected the point of the needle should be at the sphenopalatine ganglion which is located from 5 to 7 mm. beneath the 2nd division and midway

between the posterior part of the tuberosity of the superior maxillary bone and the anterior surface of the greater wing of the sphenoid bone.

Blocking the Medial Branch of the Nasociliary.—The Medial Branch of the nasociliary nerve is blocked as follows: The nares are dilated by means of the nasal speculum. A needle of small calibre is inserted into the mucosa covering the nasal septum just posterior to the lower border of the nasal bone, and is advanced approximately 15 mm. in an upward and posterior direction. Two mils of a 1% procain suprarenin Ringer's solution is slowly and continuously injected from the time the needle enters the tissue until the proper depth has been reached.

The blocking of the right and left sphenopalatine ganglion and the right and left medial nasal nerves will produce a rapid and profound anesthesia for operations upon the nasal septum.

DISCUSSION.

Dr. M. P. Boebinger, New Orleans: The most interesting thing to me about nerve blocking, especially in blocking Meckel's ganglion, is to use a Smith needle, which is practically a right angle needle, held in pen fashion. If you will introduce your first and second fingers, or even a tongue depressor to the buccal mucous membrane, and allow the hub of the needle to rest on the last molar, that will bring you in the neighborhood of Meckel's ganglion. You will find Meckel's ganglion lies between four and seven milimeters below the second division of the fifth nerve. If one wants to go a little further, Smith has a needle that is a little longer with which you can block the second division of the fifth nerve with ease, and thereby control the frontal sinus, part of the lateral wall of the nasal chamber, and part of the septum, but Meckel's ganglion is the most important one for you to block. You can do a submucous resection almost completely by blocking Meckel's ganglion.

Dr. H. P. Jones, New Orleans: I have recently seen two effects that I attribute to nerve blocking which interested me very much, and made me wonder whether these experiences were common or whether they were unique. One was a case of blocking the inferior dental nerve for the extraction of teeth. This was done some eighteen months ago, the operation being followed by a loss of sensation of heat, partial loss of sensation in the tongue, a tingling of the upper lip, swelling of the tongue, and continuous discomfort, so far as this man was concerned. He comes to my office frequently, and I have not been able to help him very much.

The other case was one in which the inferior mental orifice was blocked and my patient had two large areas of herpes following. It struck me that perhaps nerve blocking is not always the innocent and safe procedure that we might hope it would be. I would like to have some information on the subject.

Dr. W. M. Johnson, New Orleans, (closing): The success of nerve blocking depends entirely on your knowledge of anatomy and your ability to carry out the technic. The vehicle is very im-

portant. The injection of an isotonic solution will not be followed by the usual tissue and nerve cell disturbance produced by the use of distilled water or normal saline solutions.

Perhaps the postoperative pain in the cases referred to by Dr. Jones was due to the use of distilled water as a vehicle. The failure of others should not discouarge one who is master of the technic, master of the anatomy of the operative field and has secured a proper vehicle.

RADIUM THERAPY.*

By ADOLPH HENRIQUES, M. D., Department of Medicine, Tulane University, New Orleans, La.

James Ewing, Professor of Medicine of Cornell University Medical College and one of the foremost pathologists of modern times, makes this statement:

"We must welcome the discovery of an agent which will affect cancer in a manner not open to argument. Radium can be relied upon to do the same thing under the same circumstances. Under many circumstances the result involves the disappearance of cancer tissue and the complete healing of the lesion. It is highly important, also, to recognize that the action of radium is specific, in the sense that it produces results that have not been duplicated by any other method, and produces histological changes in tumor tissue which one does not see under any other circumstances."

With a realization of the potency for good or evil of this valuable agent and with an appreciation of the innumerable difficulties to be encountered in treating such a dread disease as cancer, we submit this brief outline of a few of the many interesting cases that have come within the supervision of my associates (Drs. Menville, Magruder and Milholland) and myself within the past two years.

In this paper, the physicians with whom we handled the cases to be cited have most considerately privileged me to quote them and I hope that they are present to enter into a more detailed discussion of certain of its phases.

The first case was that of Mrs. D., referred by Dr. J. A. Estopinal, whom we now quote: "The lady consulted me because she could not breathe through her nose, could swallow liquids only and that with difficulty, had a cachetic look, slept only in 'cat naps', presented a mass in the epipharynx which made it airtight and which extended down to the lower border of the uvula. I could promise the patient nothing definite in the way of cure on account

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of the nature of the condition and in a few days cleared out the epipharynx. The pathologist reported fibro-sarcoma. The patient was better for a week to ten days.

In the course of a month to six weeks the growth had recurred and was even larger than before. The result following the radium application was marvelous. Ten days later there was no trace of the growth. The cervical glands enlarged on both sides of the neck, an adenitis such as one finds in cancer cases and which were treated by the radium at the same time, were no longer enlarged a month later. This patient was seen a month ago. There was no trace of the growth both upon mirror and digital examination. This patient had been physically prostrated by the growth. All such cases were lost before the use of radium. I heard from her a few days ago and she seems to be perfectly well. We treated this case thirteen months ago.

Mr. D. treated in connection with Dr. O. Joachim first on June 3, 1920. To quote Dr. Joachim: "This patient had malignancy involving the right half of the larynx and later the inter-arytenoid space. He refused surgical interference. At present (April 13, 1921), there is no evidence of the tumor. The prognosis as far as the tumor is concerned is good; as far as the accompanying anemia, progressive."

Mrs. C. seen with Dr. Jos. Cirino on Dec. 3 1919. Dr. Cirino says: "This lady had a cancer of the breast. The mass was removed under local anesthesia followed by the application of radium. The pathologist (Dr. Couret) reported malignancy. There has been no recurrence."

Mrs. P. seen with Dr. Salerno who states: "This case of cancer of the breast is now clinically well. She was treated on April 29, 1920, with radium followed by resection, the diagnosis having been confirmed by Drs. Harris and Friedrichs."

Mrs. D. an old lady of 78, treated by my associate Dr. L. W. Magruder who states: "When seen she had a large mass in the right breast with two large nodules just above in the chest wall. The glands in the axilla were very much enlarged and tender. She suffered sharp shooting pains in the breast, did not sleep well, lost weight and her general health was poor. The case was inoperable on account of the age and the necessity of a radical operation. At present, April 5, 1921, the mass is about one fourth its original size, the nodules have disappeared, the glands in the axilla are no longer tender and are scarcely palpable. Her general condition is good, she sleeps and eats well and has no more pain." This patient was first treated by us on April 29, 1920.

Mr. T. referred by Dr. E. F. Salerno who states: "This man had extensive veneral warts which almost entirely covered the head of the penis. I cauterized them but they recurred more violently than before. After the application of the radium they disappeared entirely, there has been no recurrence and the skin is smooth excepting the scar from the cautery."

In cases of hyperplastic or glandular endometritis with uterine hemorrhage the results from the intrauterine application of radium are as a rule excellent. The technique however is so relatively simple as compared with other conditions that we will not tarry here. Dr. W. D. Phillips, Professor of Operative Gynecology of the Postgraduate School of Medicine, Tulane University, for whom we have had the privilege of mak-

ing radium applications in a number of these cases says: "Clinically we get better results in hyperplastic endometritis than in other types of cases and this from the moderate and if necessary repeated doses, especially in young individuals. In these cases I would stress the importance of preliminary curettage both for diagnosis and for treatment."

Before proceeding, however, it might be well to cite a case seen with Dr. Jos. Cirino:

Mrs. K. had continuous hemorrhage with a soft, very much enlarged uterus which contracted under radium treatment. She was seen recently and is practically well and has had no hemorrhage since.

In the treatment of uterine cancer, radium has a valuable place. With a few exceptions, we can hope for at least palliation even in the inoperable cases.

Some of the inoperable cases may have a clinical cure established. Forsell of Stockholm reports 28% of inoperable cancers of the cervix treated by radium well after a period of five years.

Dr. R. B. Harrison with whom we treated Mrs. E. says: "This lady had a great big cauliflower mass about the cervix, decidedly inoperable, the hemorrhage almost continuous and with marked loss of weight and cachexia. At present she is clinically well, her general condition markedly improved. She feels well and has put on 25 pounds. (Patient had passed period of menopause)." Patient first seen January 8, 1920.

Dr. Maurice Gelpi, former House Surgeon of Charity Hospital, says of Mrs. V: "Patient was seen May 20, 1920. On May 22 a large mass involving the whole cervix and impinging on the vaginal vault was cauterized and radium applied. The case was inoperable, belonging to class 4 type. Inside of six weeks she showed remarkable improvement locally and generally and has continued to improve. She is strong, feels well, there is no discharge, no hemorrhage and she is preparing to take a trip to Europe.." Dr. Gelpi says: "This case belongs to the class of cases in whom the cautery was generally used and the patients were sent home to take morphine."

In conclusion, I would like to report two cases of myelogenous leukemia in which the results so far obtained have been striking as both patients have shown a marked improvement in the reduction of the size of the spleen, in the blood picture and in their general condition. The blood examinations in these cases were made by my friends Drs. Harris and Friedrichs and are of great importance in that they are not only of diagnostic value but also serve as an index to degree of pathology present and also aid in determining the application of the radium.

Case 1, referred by Drs. Phillips and Harrison. The general condition before treatment was poor, the spleen occupied the en-

tire upper left quadrant of the abdomen. On Nov. 4, 1920, the leucocytes numbered 880,000, myelocytes 30%. In this case all the long bones were treated by X-Rays for ten days, the leucocytic count dropping to 811,000, myelocytes to 13%. On December 14, radium was applied to the spleen and the leucocytic count dropped rapidly to 496,000 on December 28, and on January 7, 1921, to 22,000, myelocytes 8%. At present his leucocytes have risen to 80,000, the spleen is palpable with difficulty, he looks well, has gained 24 pounds in weight (within one pound of his best weight reached seven years ago.) He feels well, works every day as a flagman on a passenger train and does not tire easily. He complains only of lack of appetite.

Case 2, is extremely interesting on account of the enormous size of the spleen when treatment was begun. The spleen extended in all directions, bulging the abdominal wall anteriorly, to the left and extending to within 2 inches of the symphysis and to within a half inch lateral abdominal wall.

The case was first diagnosed August 7, 1920. The blood at that time showed Red Blood Corpuscles, 3,760,000; Hemoglobin, 54%; Leucocytes, 328,000; Myelocytes, 36.5%.

In spite of the most excellent and intelligent medical care the anemia and weakness gradually increased and on February 2, 1921, when radium treatment was instituted his red cells showed 2,165,000 and his leucocyte count 308,000. Radium was applied to the spleen alone. We have made three series of applications in all. Today, the spleen is well within the left upper quadrant and is still growing smaller. His general condition is good, he works every day and says he never felt better in his life. His blood picture now shows: Red Blood corpuscles, 4,560,000; Hemoglobin, 85%; Leucocytes, 59,200; Myelocytes, 6.5%.

The most important feature of this case to me is that in spite of the fact that we treated only the spleen with radium that there is a marked improvement in the hemoglobin and red blood cells, coincident with the marked diminution in the leucocytes and in the size of the spleen, at the same time the general condition has markedly improved.

As a parting word, we realize the fact that we have had to feel our way very slowly and conservatively in our radium treatments as we have had so few sign-posts to guide us and have had to establish practically our town technique.

We believe that we have been particularly fortunate in producing relatively few burns although we have made nearly one thousand applications of radium within the past two years. This has been due to the fact that we have made use of the gamma radiations wherever possible and we have ever borne in mind the physics of radium therapy so closely allied in many ways to the action of X-rays which the author has handled for the past fifteen years.

I wish here to publicly thank my associates Drs. Menville, Milholland and Magruder for their valuable aid and co-opera-

tion and Dr. Magruder for his numerous practical suggestions in this pioneer work in a new field of medicine.

A close observation of the literature indicates that myelogenous leukemia treated by radium may undergo a clinical cure and remain well for a period of 6 to 8 years. Among the most recent articles is that of Regaud and Napier of France.

DISCUSSION.

Dr. Allan Eustis, New Orleans: In the second case reported by Dr. Henriques there has been really a remarkable improvement and I am in a position to compare the results of radium treatment with those we obtain with the X-Ray.

The man first came under my observation in October, 1920, when he had a white cell count of 800,000 and some odd, and a red cell count of 2,500,000. Under X-Ray treatment and with hematonics his red cells went up to 4,000,000 and some odd. His spleen was not palpably influenced. His white cells went down from 800,000 to 200,000. They were 300,000 at various times. His myelocytes under the use of the x-ray went from 15 per cent. to 8 per cent. However, he improved only slightly. There was a transient albuminuria and a decided myocardial degeneration, with dyspnea on slight exertion. We kept up the x-ray treatment from October until February. The patient asked me about taking radium. I had no experience with it, and I told him he would have to take it on his own responsibility, as I undersood there was a certain amount of danger in connection with the leukocytes after apparent cure. We finally put him under the radium, and the last time I saw him was about April 1, when his spleen was half as large in the position that has been shown in the diagnosis by Dr. Henriques. During the whole time he was taking x-ray treatment I could palpate the lower border of the spleen just above the symphysis. It was an enormous spleen pushing against the pubes. Symptomatically, he has certainly improved not only physically but his blood pressure from being 100 is now 128. He has less dyspnea, but of course, he is not cured. I think the last cell count I made in April showed 80.000. There was marked improvement. We must not lose sight of certain points in this case, that is, possibly in our interest in regard to the spleen we may neglect the fact that the primary lesion is in the bone marrow, and I would like to ask Dr. Henriques whether it is not a good plan to x-ray the bone marrow along with the radium treatment of the spleen.

Dr. Wm. D. Phillips, New Orleans: I have been particularly interested in Dr. Henriques' paper from the standpoint of gynecology, and have been most interested in the type of cases referred to as hyperplastic or glandular endometritis. That is the type of case we all remember coming to us suffering from profuse menstrual bleeding or irregular bleeding associated sometimes with leukorrhea. In this type of case, the hemoglobin per cent is usually low. We give various drugs to control the bleeding with no results. Frequently we have resorted to curettage, and the relief from it has only been temporary. Finally, as a last resort before radium

was used, we invariably did a hysterectomy. The results from this operation were not very good because the patient was in bad shape and was subjected to the danger of an operation which she should not have been subjected to. With radium we have a valuable aid which removes the indications for hysterectomy in that type of cases.

There are two points I wish to stress. If this treatment is instituted in a young woman we will have to worry about the possibility of producing the menopause. In that type of case it is usually best to defer radium treatment as long as we can. However, when necessary with frequently repeated doses of radium we avoid that danger to a certain extent. When radium was first started in this type of case, it was given in one large dose. With the method of using it in frequently repeated doses we avoid that danger. Sometimes we have to use two or three applications before we can get the relief we want.

I also wish to urge one other important thing, and that is the question of preliminary curettage. I have seen some of these cases treated by simply applying radium without subjecting the patient to preliminary curettage. In the first place the curettage does good by removing a large amount of glandular material and in this way gives them some relief. In the second place without preliminary curettage we are liable to overlook a malignant condition. These cases should always be subjected to preliminary curettage and the scrapings carefully examined and then the radium applied.

In regard to the question of malignancy, I am glad to see that most men who are using radium are now advocating the use of radium in the early cases of cancer. It was the custom sometime ago to only use it in the advanced cases. Dr. Will Mayo recently in an article in Surgery, Gynecology & Obstetrics has stated that radium helps considerably as a preoperative treatment by devitalizing the cancer cells and rendering them less liable to grafting at time of subsequent operation, and for that reason he advises the preliminary application of radium a few days before operation is done.

Dr. S. M. D. Clark, New Orleans: I was much interested in hearing the story about a friend of mine who was a skeptic about radium, and by the way, at the present time he owns 150 milligrams of radium. The case that converted him to the use of radium was that prior to his leaving for the Army a patient came to him, he examined her, and stated that she had an advanced inoperable carcinoma and that surgically her case was hopeless. Radium was her only hope. In the meantime he left for the Army. The woman took three applications of radium and then began to improve so much that she began to doubt the word of the first observer. She consulted two other men some months after she had taken the three applications of radium, none of whom could find any pathology. When the first man returned from the Army the woman returned to him and said: "I am going to institute suit against you, you told me I had cancer and it is not so. I have been to two other doctors since I have seen you, and they have found nothing there." The first Doctor said: "Madam I thought I was right, let me examine you now. He found her completely relieved of all vestiges of cancer. This impressed him so deeply that he went out and bought some radium."

Returning to the points made in the paper, I will say that I reported two years ago fifty cases of hemorrhage from the uterus other than from malignant diseases, at the Atlantic City Meeting of the American Medical Association and in this field it has no equal.

As to the cause that Dr. Phillips referred to as hypertrophic endometritis, that is not the true pathology. They bleed and it is either hysterectomy or the use of radium. It is more of a chronic metritis, and the endometritis is only a small part of the general picture. In these cases radium is a specific and especially is its use desirable where we have defective organs, such as cardio-renal conditions, or some pulmonary condition where surgery is contra-indicated. But where surgery is not contra-indicated radium is far superior to surgery. Occasionally patients live quite a long distance and do not want to run back and forth and in these cases one can do a vaginal hysterectomy.

Radium has a definite field in cases of carcinoma of the uterus, not only in the advanced hopeless cases, but in those that are borderline in which heretofore we would have used the cautery, ligate the internal iliacs and leave the artery of the round ligament to supply the blood. Now radium has displaced the cautery absolutely. It is much simpler in its application, less discomforting, and I believe more efficacious. My experience with radium as a permanent cure in these cases has been this: I have had some women remain well, but in the majority of them radium gave the most spectacular and magical relief the first eight or twelve months, and one thinks that all is well. However, after this time they begin to have pain and you will find that metastases have taken place, and instead of getting a brilliant result the woman is backk in the state that she was before, only having gotten temporary relief.

My position is this after using radium, if we can get these patients before the state of fibrosis sets in, that is before the eighth week, when the patient is transformed constitutionally and locally, we can remove the organ surgically and subsequently use radium.

This is a most important position for radium in the treatment of carcinoma of the uterus if you operate before the fibrosis stage sets in. If you wait until it is too late, you cannot remove the uterus. If you wait the proper time you have devitalized cells still having sufficient lines of cleavage to permit the radical removal.

Dr. S. K. Simon, New Orleans: I want to add two cases of rectal carcinoma I saw during the last year to Dr. Henriques' interesting series of apparent radium cures. In one of those cases I was able to follow the results of the radium treatment, and to any one who is inclined to be doubtful as to the effect of radium on malignant tissue, I will say that this particular patient came from the country and Dr. Matas and myself were very much opposed to performing colostomy, so high up was the seat of intestinal obstruction. There were no free movements of the bowels for two weeks prior to her visit to the city. There was almost complete intestinal obstruction. Within two weeks after the application of radium the intestinal lumen seemed to open up, as it were, sufficiently to allow the passage of soft stools. Prior to the application of radium the proctoscope showed a large cauliflower ulcerated growth, but at the end of three months this ulcerated mass appeared almost insignificant, so much so that the index finger was passed through the lumen of the mass without any difficulty. Subsequently this woman had radium applications every six weeks, and the carcinoma was apparently cured. I say apparently because I do not think we should say cured in the full sense of the word until a certain time has been reached. Since we have in carcinoma of the lower rectum a certain means of relief at the present time in radium, and it is such an easy method, it behooves us to keep in mind this only possibility in the treatment of carcinoma of the rectum. A diseased condition of the rectum is not infrequently overlooked,

falling under the guise of hemorrhoids or dysentery or catarrhal enteritis. Some much simple explanation is given because the attending physician often fails to introduce his finger within the rectum and diagnose the case by means of palpation. If this was done more often in conditions of the lower rectum at an early period, we have within our reach a certain method of cure by the use of radium.

THE FUNDAMENTAL PROPERTIES AND THERAPEUTIC USES OF RADIUM.*

By CHAS. HENRY VOSS, A. B., M. D., New Orleans.

Daily the physician is confronted with various questions concerning radium. What is it? How does it act? Will it cure Cancer? How do you use it? etc. Articles on radium are being published monthly in the leading magazines and journals that enter the average home, as well as in the leading surgical and medical journals. Only a short time ago a patient on whom radium had been applied for pruritis vulvae became alarmed when a friend told her that she had cancer or the doctor would not have applied radium. She decided to return to the city at once, when in her monthly journal she noticed an article stating that radium is being used for other maladies in addition to cancer, and with success. This served to relieve her anxiety.

The day is passing when radium and cancer or inoperable cancer are being used as synonymous terms. As we are coming to a better understanding of the action of radium on both normal and pathological tissues its scope of usefulness in non-malignant cases is rapidly increasing. The present finds radium the agent of choice in many conditions that came under the domain of surgery but a few years ago. In hemangioma and tubercular adenitis for instance, radium gives very satisfactory results and without leaving unsightly scars to mar the patient for life.

Let us review what is known of the properties of radium and radio-activity. How does radio-activity produce tissue changes for better or for worse? Radio-activity is the spontaneous decomposition of the heavy atoms of an element with the emission of small parts of them, Rays, and the production of new forms of matter. It is this energy in the form of Rays that we make

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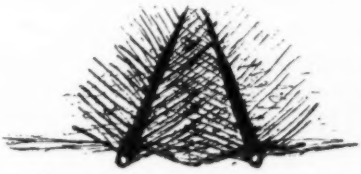
use of to destroy certain pathological tissues, and in other instances to stimulate normal tissue production.

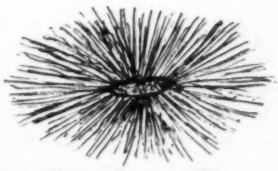
The preparations of radio-active substances in common use today are radium bromide, radium barium sulphate, and radium emanation. Radium salts and radium emanation, a gas constantly being formed by the transmitting radio atom, emit three kinds of rays; Alpha, Beta, and Gamma rays.

The Alpha ray is a Helium nucleus or a positively charged particle of the element Helium shot out from the radio atom at a velocity of from 9000 to 15,000 miles per second. These tiny particles are very readily absorbed having a range in air of but a few centimeters, 2 to 8, and .01 milimeters of aluminum serves to completely absorb all Alpha rays, therefore these rays are too readily absorbed to be of any service in the application of radium.

The Beta ray is a negative electron shot out from the radio atom at a velocity approaching that of light, 186,000 miles per second. These rays are half absorbed in one millimeter of soft tissue and the next millimeter absorbs one-half of the remainder etc. Therefore the therapeutic uses of the primary Beta rays are limited to the treatment of skin lesions not exceeding several millimeters in thickness; for example, Hemangioma Rodent Ulcer, Moles, Benign Papilloma etc. When Beta rays are being used the Gamma ray effect is negligible.



Divergence of Rays



Cross fire using needles.

Gamma rays unlike the Alpha and Beta rays are ether disturbances of high frequency, similar to X-Rays, set up by high frequency vibrations of electrons in the transmuting radio atom. They are caused by the rapid passage of escaping Alpha and Beta rays from the radio nucleus. Gamma rays are one-half absorbed in the first eight inches of soft tissue. The Gamma rays are only effective for a depth of about one inch, due to the rapid falling off in intensity by reason of the divergence of

the rays. By using the cross-fire method, however, we are able to get a much greater intensity of the rays at a given point. For example, needles buried in a tumor mass are two to four times more effective than the same amount of radium applied over the surface of the tumor mass. Again in Carcinoma of the Pharynx heavily screened radium may be applied externally while radium needles are buried in the mass internally.

When Gamma rays are employed the radium must be left in place for a much longer period of time since the deep penetrating Gamma rays represent only about 5% of the total radio activity. When using Gamma rays it becomes necessary then that we screen off the Beta rays as they would produce a destructive reaction in the immediate vicinity of the radium in this length of time.

In dealing with radium rays it must be borne in mind that their intensity decreases as the square of the distance, for example one millimeter from a diseased area gives a certain dose, then 10 millimeters from the tissue gives one one-hundredth of the same dose instead of one-tenth. The distance of the radium from the lesion is highly important then in guaging dosage.

Having learned something of the nature and penetrating power of the primary rays of radium, the next question is, what changes do they produce in the living tissues and how? The action of Beta and Gamma rays are similar since the Gamma rays act by setting up secondary Beta rays in the nuclei of the living tissue cells as they pass through them.

Radium rays have a specific action on the chromatin substance of the nuclei, more especially the dividing nuclei. Chemical processes are set up by the rays and the end result of these processes is determined by the amount of ray dosage given to start them. Very small doses may stimulate cell growth and more especially cell function while larger doses will sicken the cell which may later recover to grow vigorously, or it will gradually undergo liquefaction necrosis and be absorbed. If the dose be sufficiently large, however, the cells are actually destroyed in the immediate vicinity while those nearby are sickened and later die.

Two striking changes are noticed following the application of radium. The decrease of parenchymatous cells with a corresponding increase in the connective tissue cells, therefore parenchy

matous tissue cells are more susceptible to radium. and following their destruction they are replaced by connective tissue. This explains why the Gamma rays give such satisfactory results in lymphatic leukemia and enlarged Thymus.

Immediately following the application of radium there is a dilatation of the smaller blood vessels. This explains why the tissues bleed more freely for the first few days of the reaction, and why it is unwise to operate within ten days to two weeks thereafter. Also the lymphocytes are diminished in number thereby temporarily lowering the resistance of the tissues. Within two to four weeks the lymphocytes begin to return to their normal proportion and the lymphatics and smaller blood vessels begin to undergo a fibrosis. An overgrowth of connective tissue begins which in turn goes on to maturity contracting as in a visible scar, squeezing the fibrosed lymphatics and smaller blood vessels thereby decreasing the nutrition to the part and at the same time diminishing the possibility of metastasis.

The more nearly the cell approaches the embryonal type the less resistant to the radium rays. Since malignant growths are cells of the old parental type growing with no regard for law or order they come under the above law and are susceptible to the radium ray. A ray dose sufficient to destroy these rapidly growing cells will not of necessity destroy the normal tissue cells, and it is this fact we are striving to take advantage of in the application of radium.

After an application of radium a long enough interval is allowed to elapse for the normal tissue to recover its vitality then the ray dose is repeated and this is kept up until we feel that the destruction of all malignant cells has been accomplished. It is this time interval, and the size dose that can be delivered as the "Knock Out" dose, without the excessive destruction of the normal tissues that determines success or failure in the application of radium. The cry of the radiotherapist like that of the surgeon is *bring your case early* when the dosage sufficient to destroy the malignant cells will not of necessity have to be large enough to cause excessive normal tissue destruction.

The more specialized the tissue, the more resistant to radium rays. This fact explains why certain types of tumor respond so much more readily to radium rays than others. Contrast

the uterine Leiomyoma which is very susceptible to radium to the Melenoma which is very resistant to radium.

The above explains why a keloid of short duration will readily respond to radium treatment, yet the same keloid left over a long period of time responds stubbornly, due to the fact that the young fibroblasts have had time to grow to maturity and become more specialized and therefore more resistant.

A malignant growth must be looked upon like an eating forest fire. It eats its way in every direction. Do not attack it at its center. Treat it like the forest fire. Even at the expense of normal tissue try to destroy the invading cells at the periphery. Cut off their nutrition and at the same time seal up the lymphatics by making a coffer dam around the growth. Use the Gamma rays over moderate periods of time and at frequent intervals giving the normal tissues time enough to recover some of their vitality between doses. This method is giving the best results.

The ray dosage required in the treatment of the various conditions for which radium is used today depends upon many factors. No simple rules can be laid down in this respect. So many Milligram hours is of no particular significance unless there is also taken into account the number of milligrams of radium element or Millicuries of radium emanation, the type of applicator, the distance between the radio- active substance and tissue, the screening used, the time intervals if any etc. All come in for their important part in the dosage of radio active substance. The effect of 1Mg. of radium element applied for 1,000 hours would not be the same as 100 Mg. applied for 10 hours. In the first case the dose would not be cumulative. It is of interest to note that any amount of radium element above 50 Mg. however, makes little difference in the end result other than the time factor, which will necessarily decrease as the amount of radium element increases. From the above we see that experience and careful study of each case is of highest importance in obtaining the best results.

The tendency today is toward larger doses. I have had Doctors tell me to give their patient the largest doses possible. "Knock him Out." Possibly this may be the fault of the radiotherapist, too small doses, however, I want to ask the question why are we conservative in dosage today. Some of the

earlier workers with radium began by using enormous doses but with distastrous results. The pendulum began to swing back and perhaps went to the other extreme. Now I believe we are swinging to the "Happy medium." In giving large doses of radium rays it is very important that we feel our way for once the overdose of radium is given the Doctor is helpless. All he has at his disposal is opiates to relieve the pain and often morphine in extremely large doses fails to give relief. Too often we give one large dose for convenience sake rather than give it in broken doses which is the more logical procedure. Larger dosage given as a series dose, I believe is the best method to follow.

The proper application of radium is essential in avoiding unnecessary complications. Fatalities have resulted either directly or indirectly from faulty or carelessly applied radium that could have been avoided. Very often it is a difficult matter to get properly screened radium into the uterine cavity. For instance, the radium must be put well up into the uterine cavity and held there by a small cervical pack together with a Vaginal pack or there is a possibility of it falling out upon the posterior vaginal wall, thereby producing a severe burn or resulting in a recto-vaginal fistula. If necessary give the patient a short anaesthetic and put the radium where you want it and be *sure* it will *remain there*. If radium is to be applied into the lumen of the rectum it should be heavily screened, otherwise a stricture will result. In massive doses even this will not always prevent strictures, therefore when it is necessary to use massive doses do a colostomy and attack the Malignant growth from above as well as below.

Radium in malignancy means prolonging life and minimising suffering. If through faulty application or carelessness we fail in these, much of the criticism among some of the members of our ranks is justified. However. radium therapy has fully weathered the experimental stage. Many influential medical men look upon it with disfavor, but careful and conscientious work has amply demonstrated the increasing scope of its usefulness.

Let us continue to study the scientific application of this valuable therapeutic agent, confident that radium has done more to assist surgery and the X-Ray in combating malignancy than any other therapeutic agent known to the present time.

DISCUSSION.

Dr. John B. Elliott, New Orleans: I want to utter a word of warning regarding the use of radium. I have seen three cases in the last month in which radium was applied to women before the time of the menopause for menorrhagia. The use of radium stopped the function entirely. These patients have various phenomena and go through a life of several years of misery. I am opposed to the use of radium for menorrhagia in women before the age of 40 on account of the unfavorable results I have seen from its use. One patient has gone through five years of hades through suffering and nervousness, and the normal function was stopped by the use of radium. She has had five years of hell, which is the only word to use.

Dr. E. Denegre Martin, New Orleans: I was much surprised the other day when a lady informed me that she had found radium to be one of the best things to prevent pregnancy.

Dr. C. H. Voss, New Orleaens (closing): With reference to uterine hemorrhages one man said to me you are using too small doses in your cases of menorrhagia or metrorrhagia before the menopause. Some men use large doses; such as 75 or 100 milligrams for 12 to 18 hours, and repeat it every week for 2 or 3 applications. In using these large doses I believe the patient is being exposed unnecessarily, for in the great majority of cases this condition is relieved with much smaller doses.

In a report of 600 cases of menorrhagia by Leda J. Stacy, Rochester, Minn., August 1920, the average dosage used was 300 milligram hours (50mg for 6 hours) and the largest dose 600 milligram hours (50mg for 12 hours). No treatment repeated under three months. This may be ultra conservatism, but to relieve one condition without producing other disagreeable conditions is our aim. The man who uses large doses, I believe, already has or will have cases in which he will regret that smaller doses were not used.

ACUTE DIFFUSE GONORRHEAL PERITONITIS WITHOUT TUBAL RUPTURE.*

By MAURICE J. GELPI, M. D., New Orleans.

A review of my records of five hundred consecutive abdominal sections selected at random, reveals the fact that ninety-nine or practically twenty percent required immediate operation. Of these cases, where diffuse peritonitis was present, the cause of the peritonitis was in most instances, definitely determined. Among the causes assigned were: ruptured appendix or appendiceal abscess; ruptured gall-bladder; ruptured ulcer; ruptured pus tube; and perforated intestines. In all other cases, the origin of the peritonitis was not determined. It is with particular reference to this type of peritonitis in women that my case is reported.

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In making note of this case report please recall the generally accepted pathology of gonorrhea in the female. The primary infection usually takes place in Skene's glands, in the vulvo-vaginal glands, or in the cervix itself. Further infection takes place by direct continuity through the cervical canal, into the fundus and from there into the tubes. As the infection progresses still further in the lumen of the tube, the frimbriated extremity is sealed over promptly and is occluded. The beginning of a pus tube is thus formed. The peritonitis accompanying this process has always been conceded as being distinctly pelvic and localized more or less to the tube proper or to its immediate surroundings; unless rupture supervened.

Mrs. C. N. was admitted on January 11, 1921. Her chief complaint was acute abdominal pain.

She had been perfectly well up to January 10th. when at 7 P. M. after eating, she was taken with sudden severe abdominal cramps, at first localized in the right lower quadrant. Later the pain became general. At 10 P. M. she vomited copiously. She became constipated and had headache. The pain and vomiting continued up to the time of admission. She did not complain of her bladder nor of any other disturbances except as noted.

When first seen the patient had a temperature of about 100, pulse 120, respiration 26. She looked sick. The abdomen was uniformly rigid, moderately distended and very sensitive to touch. The external genitals were hot, somewhat red and the discharge attracted no particular attention. The blood count showed 36,500 W. B. C. and 95% neutrophiles. Vaginal examination was negative except for pain. Laparotomy revealed an acute diffuse suppurative pus. The gall-bladder was negative. The appendix inflamed but not ruptured and the tubes were found bathed in pus, but entirely free from adhesions, and the fimbriated extremities were demonstrated as being wide open.

At the time of operation, the origin of the peritonitis was admitted to be unknown and certainly not pelvic on account of the patulous tubes. The pus from the cavity was composed of one third lymphocytes and two thirds neutrophiles with many intra and extra cellular gram negative diplococci.

Dr. Daunoy of the Charity Hospital to whom I am indebted for these and other examinations in the case, reports that these diplococci were grown on suitable medium and that all cultures grown on ordinary medium were sterile. Subsequently, gonococci were demonstrated and grown for a second time from the abdominal pus, from Skene's glands, from the vagina and from the cervix.

The point that I want to make particularly, is that in women in the presence of an unaccountable peritonitis, even when the tubes are patulous and free, the proper procedure should be to make a smear of the abdominal pus so as to be properly

guided in the selection of the medium for the culture. Such a routine will undoubtedly explain a definite number of cases of peritonitis of apparently idiopathic origin.

DISCUSSION.

Dr. E. A. Ficklen: Dr. Gelpi's case called to my recollection a similar case that occured in my practice a little over a year ago. The patient was 48 years of age so I had even less reason for suspecting the existence of gonorrhea than did Dr. Gelpi. It is to be noted that Dr. Gelpi's case of peritonitis was caused by the gonococcus in pure culture. It has been conclusively demonstrated by Norris and other close observers that cases of diffuse peritonitis are seldom caused by the gonococcus in pure culture.

The first detailed case report of this type of peritonitis was published by Dr. Harvey Cushing in the Johns Hopkins Bulletin in 1898. Although the gonococcus was discovered by Neisser in 1889 it was thought for years that its distribution was confined to the genito-urinary organs. Subsequently, when it was found in cases of Otitis Media, gonococcus pneumonia and gonococcus arthritis, it became evident that a wide distribution of this organism was possible under certain conditions.

Dr. Polak states that the gonococcus may cause endosalpingitis and later spread, by the lymphatics, to the peritoneum or pass directly from the fimbriated end of the tube. In Cushing's case the pressure on the tube forced out a drop of pus through the abdominal ostium. An interesting point in cases of gonorrheal peritonitis is that the patients are apparently not very sick. The peritonitis does not progress as rapidly nor follow so virulent a course as that produced by other pyogenic organisms.

The mortality in these cases is about 11%. Norris, in Gonorrhoea in Women, reports cases of gonorheal peritonitis in girls from 4 to 12 years of age following gonorrheal vulvo vaginitis. Gonorrheal peritonitis following rupture of a pus tube must not be confused with the type of case reported by Dr. Gelpi, and is of comparative frequency. Norris reports 97 cases. As far as I have been able to find there are only about thirty reported cases of diffuse peritonitis without rupture of the tube caused by the gonococcus in pure culture.

Dr. John F. Dicks, New Orleans: The subject of pelvic infection is one that interests me a great deal. I have never seen a case of true rupture of a pus tube itself. In considering the pathology of pelvic infections we must bear in mind the two distinct types or cases, the gonorrheal or intra tubal, the post portal or post abortal, which are extra tubal or essentially broad ligament infections. In the first type rupture of the tube is rare. In the broad ligament infections the Pyogenic organisms spread from the cervix through the lymphatics into the layers of the broad ligament and a distinct cellulitis or abscess formation takes place. If this collection is not drained we may have a rupture of the broad ligament due to increased tension.

I recall four distinct cases of diffuse peritonitis at Charity Hospital from rupture of the broad ligament, but cannot recall one case of diffuse peritonitis from true rupture of the tube itself.

Dr. J. A. Danna, New Orleans: I am very glad to have heard Dr. Gelpi's paper, as I believe he has brought out a very interesting point. The danger, however, of looking upon a peritonitis as something which may only be due to a condition in the pelvis, or to rupture of an appendix, must be clearly borne in mind. In other words, we should not be satisfied in opening the abdomen with

member there are other things that may happen to produce a general diffuse peritonitis. Rupture of gastric and duodenal ulcer is of very common occurrence. A rupture of the gall-bladder is possible. A rupture of a typhoid ulcer in a patient that has walking typhoid is not at all uncommon. There are any number of pathologic lesions of the intestine high up which may by rupture give rise to general peritonitis. Therefore, I do not want the impression to prevail and I am sure Dr. Gelpi did not create that impression—that when you have examined the tubes and appendix, you are through looking for the cause of general peritonitis.

The essayist brought out a strong point when he said that every surgeon, who considers himself well equipped, ought to have available a pathologist that can make quick and immediate examinations in cases of this kind. If you open the abdomen, and think you have located the cause, get a smear of the pus, and you may find you have gonorrheal peritonitis. I dont think you ought to look for rupture of a gastric ulcer, or rupture of the gall-bladder, or anything else, especially if the local conditions in the pelvis show there is an infection already in the genito-urinary tract.

Dr. M. J. Gelpi, New Orleans, (closing): I was very much interested in hearing Dr. Ficklen say he has had such a case as we described, and I am glad he had something to say on the subject.

I have to disagree positively with Dr. Dick's attitude with reference to rupture of the tube. The pathology of abscess from gonorrheal infection and from streptococcus infection is so entirely clean cut that I can hardly conceive of a mistake being made in the gross. This patient had a history that was clean cut, and in the gross you have two distinct conditions. In one instance, as I pointed out in my paper, you have an infection coming from the outside progressing by direct continuity into the tube and there causing a chronically infected process affecting the whole tube, and more particularly the inside. Even when the abscess reaches an enormous size you can still see it is restricted to the tube.

In the case of infection of streptococcal origin, you have several possibilities there. You may have infection by direct continuity, although that is rare. You can have it from the blood vessels, or what is most common from the lymphatics of the cervix. You have first a lymphangitis, then a cellulitis, and if that process continues you have a definite parametritis, and the abscess definitely localizes in the broad ligament, and can be plainly seen from above. In some cases of drainage you get prompt and permanent relief. Those are the cases where the abscesses are localized in the broad ligament. You drain these abscesses and the patients get well. If you should operate subsequently for something else, you will find a remarkably good condition of the uterus and adnexa. These cases clear up remarkably well and you doubt your diagnosis sometimes. In the other instances where you drain such an abscess, where the condition is localized in the tube itself, the tendency is for recurrence to take place. In the gonorrheal pus tubes there is a tendency to recurrence of the abscess because you have a distinctly encapsulated and localized infection restricted, more or less entirely to the tube. Today when we open the abdomen seldom do we explore it without going over the contents thoroughly. In most instances one shows much better judgment to restrict the exploration to the infected field and deal with the condition one finds there.

I mentioned distinctly in my paper that the gall-bladder, duodenum and other structures were carefully considered before labeling the case peritonitis.

KIDNEY SURGERY UNDER LOCAL ANESTHESIA*

By CARROLL W. ALLEN, M. D., New Orleans.

My object in presenting this paper is to answer in detail inquiries which have been made regarding the scope and possibilities of local anesthesia in kidney surgery. I will consequently confine my discussion exclusively to the technical side.

The indications for local may be briefly stated to be any condition in which the hazard of a general anesthetic is to be avoided if possible.

The question of para-vertebral anesthesia in kidney surgery has often been discussed, but it is not at all popular among my confreres who frequently make use of local anethesia, and for my own part I much prefer the direct method of attack. Para-vertebral anesthesia is accomplished by reaching the anterior branch of the spinal nerves just in front of the transverse process of the vertebra, by passing a long needle down through the tissues of the back. To anesthetise the kidney area it is necessary to block from the ninth dorsal to the third or fourth lumbar inclusive.

As the skin and subcutaneous tissues through which the kidney incision must pass receive some nerve fibres from the dorsal branches of the spinal nerves this area must be infiltrated in addition, and this infiltration carries you down to the posterior surface of the lumbar fascia, immediately in front of which is the quadratus lumborum, which muscle is attached to the tranverse processes of the lumbar vertebrae and under surface of the last rib. You have consequently but to pass this fascia on the outer margin of the quadratus muscle and you are in front of the transverse processes along which it is easy to advance towards the vertebrae and reach the anterior branch of the spinal nerves by a more exact and simpler method.

Technic of Local Anesthesia in Kidney Operations.—The patient is laid on the table in the proper position but the table is not broken or the Lillianthal bridge raised until the kidney is ready to be exposed, as this position if maintained too long may be uncomfortable. A skin wheal is made about the center of the proposed incision, through which a long needle fitted on a large syringe is entered, this is passed upward slowly under

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the skin along the proposed line of incision, injecting as the needle is advanced to the interval between the eleventh and twelfth ribs. The needle is now partly withdrawn and directed downward along the proposed line of incision beneath the skin infiltrating the entire distance down to the crest of the illium.

The needle is now partly withdrawn and directed vertically downward from the skin surface to reach the lumbar fascia, which is recognized as the first plane of resistance in the deeper parts. The attempt should be made to reach this fascia just at the outer margin of the quadratus lumborum muscle. This is pierced by the needle at about three points an inch or more apart just on the outer border of the muscle and the tissues beneath the fascia infiltrated. Having completed the injections, the skin is now infiltrated intradermally with a small needle and syringe. This is purposely left to the last and this slight interval after the deep injections have been made allows the solution a slightly longer time to saturate the tissues.

This skin injection can be omitted if the subcutaneous injection has been made just beneath the skin but if this is done in stout subjects an additional injection should be made in the subcutaneous tissues at a slightly lower level. The incision is now made the entire length of the field and carried down to the lumbar fascia. The twelfth nerve is now injected high up, just under the twelfth rib. This nerve is a large trunk, larger than the other intercostals, about $\frac{1}{8}$ of an inch in diameter, and runs obliquely downward across the field. At two inches from the spinous process of the vertebrae it lies about one inch below the rib, from this point it follows the outer edge of the quadratus lumborum lying in close contact to it beneath the lumbar fascia as far down as the crest of the ilium. It should be injected high up, proximal to the field. The long needle is now passed inward through the lumbar fascia and the cellular tissue and fat around the kidney lightly infiltrated.

All bleeding points are now ligated; the table broken or the bridge raised. This interval allowing time for the last made injections to diffuse.

The lumbar fascia is now divided close to the edge of the quadratus lumborum, the twelfth dorsal nerve is exposed and should be protected. The finger is slipped in over the surface

of the quadratus muscle toward the vertebral column and the long needle passed in along side of it and the tissues just to the side of the bodies of the vertebrae and in front of the transverse processes are lightly infiltrated at three or four points up and down the spine. It is here that the rami communicantes which come forward from the spinal nerves join the sympathetic chain along side of the vertebrae. These nerves carry sensory fibres to the abdominal plexuses. The bodies of the vertebrae are easily palpated with the structures lying on it the aorta and vena cava.

We now open the cellular tissue and fat around the kidney and deliver it into the wound.

If the kidney is to be removed, bisected or the operation involve its hilum a light infiltration is necessary around the vessels, but this is not needed if the operation is limited to its cortex. This additional infiltration is necessary as all arteries carry sensory nerve fibres. On the renal arteries they come from the plexus on the aorta.

This completes the technic and when done in a methodical way is quite quickly executed.

You will notice in this description that the injections are made in several stages and after each stage there is a pause in which such necessary steps as applying ligatures is performed, or the kidney bridge raised, this interval allows time for the infiltrations to thoroughly diffuse without losing any time. Once the needle has entered the skin it is not removed until all the superficial injections have been completed, but is only partly withdrawn and redirected in different directions, this is done to reduce the trauma of repeated skin punctures.

By proceeding in this methodical way much time is saved. In one case of nephrectomy in which the patient's son, who was a physician, was present he informed me when through that we had taken forty-five minutes, probably ten minutes longer than would have been required for such a case under a general anesthetic.

The anesthetic solution is usually ½% of Novocain with 3 or 4 drops of Adrenalin to the ounce, from 6 to 8 ounces is usually necessary.

I prefer a 5 or 10 cc. syringe which should fit the needle with a slip joint, so as to be easily removed for refilling with-

out disturbing the needle. The needle should be of fine calibre, about four inches long with a sharp bevelled point.

It is preferable that the patient have a light meal at the regular meal time preceding operation. About one hour before going to the operating room an opiate is given by needle usually 1/4 grain of morphine with 1/150 grain of scopolamine, in nervous individuals 1/3 grain of pantopon is substituted for the morphine, and in elderly patients the scopolamine is omitted.

It is decidedly objectionable to blindfold the patients or to plug the ears as is sometimes done. I always prefer to talk with them during operation, this helps to divert their mind and dispels any fear. Many are slightly nervous when they start but soon quiet down and gain confidence when they find they are not to be hurt.

The post operative condition is in marked contrast to similar cases operated under general anesthesia. There is practically no shock, often no nausea and the patient is at once able to take draughts of water and pain is usually not felt in the wound for two or three hours following.

The survival or failure of any methods advocated for practical daily use must rest entirely with the clinical results obtained and those methods which attain these ends with the least disturbance to the patient and the least suffering must ultimately prevail over all other harsher and less agreeable methods.

While I frequently use this method in operating where there is no contraindication to a general anesthetic the two following cases illustrate its advantages in bad risks.

Mr. B, age 57, referred by Dr. Eustis. Bilataral polycystic kidney with almost complete suppression of urine. Operated right side June 22, 1916. The kidney presented an enormous conglomeration of cysts varying in size from a pea to an egg, and was of great size, wedged in between the ribs and the ilium and extending almost to the mid line of the abdomen. The last rib was resected to afford more room but it was necessary to make multiple punctures all over the mass before it could be sufficiently reduced in size to be delivered into the wound. We then systematically punctured each cyst and when completed and all cysts thoroughly collapsed the kidney presented a hilum to which was attached a mass of loose cellular tissue which hung from it in folds and represented the former parenchyma.

The wound was closed with drainage. The case was so bad we had naturally not looked for much benefit but were delighted to find the excretion of urine to improve decidedly with a corre-

sponding benefit in the patient's general condition. Ten days later the left side was operated in a similar way. The kidney on this side was probably three quarters as large as on the right. Following this second operation there was a further improvement in the volume of urine and renal function.

Patient made an uneventful recovery and left the hospital sixteen days after second operation with kidney function estimated at about 50% of normal. His general improvement was decided and he was able to resume business with a fair degree of comfort, but was kept under constant medical observation. He remained in fairly good health until a short time before death on February 9, 1920. 3½ years.

Miss H. age 27, referred by Dr. Simon. General tuberculosis with large tuberculous kidney of left side which caused much discomfort. It was hoped by its removal to so improve the patient as to permit her to better resist the progress of the disease elsewhere.

Operated 1-20-21 removing the kidney which measured 7 by 4 inches and when opened was found to consist of a series of pus sacs. Recovery was uneventful. Left the hospital 2-14 much improved, but after a few weeks returned due to the progress of the tuberculous trouble elsewhere. After about one month's stay left for home in an unfavorable condition.

DISCUSSION.

Dr. Allan Eustis, New Orleans: I was fortunate in being present when Dr. Allen operated on this man, and I kept up a periodic observation of the man three and a half years following operation. His kidney function before the operation was 5 per cent. phenolsulphonephthalein excreted in two hours, which is an unfavorable sign. The blood pressure (systolic) was 220. He was undoubtedly a case that could not have been operated under general anesthesia. You could palpate his large polycystic kidneys through the abdominal wall, and when I referred him to Dr. Allen I was skeptical as to his ability to operate on that man and go through the abdominal wall without producing some pain. I talked to the man during the course of the first and second operation, and at no time did he even feel a twinge of pain. I bring this out because I have seen a great many surgeons operate, and I have come to the conclusion that their idea of local anesthesia is really relative. Some of them are satisfied if the patient does not jump off of the table. It is only by such careful, systematic anesthesia as Dr. Allen has brought out and the identification of the nerves that complete anesthesia can be produced. This presupposes thorough knowledge of anatomy. I feel sure that this point is not thoroughly appreciated by the average surgeon, and as an internist I can speak freely and with an unbiased mind.

Dr. Carroll W. Allen, New Orleans (closing): I thank Dr. Eustis for his remarks, and I wish to say that the success of local anesthesia rests on two things, a thorough knowledge of anatomy, particularly the nerve anatomy, and a thorough understanding of the action of local anesthetics. I do not think a knowledge of anatomy alone is sufficient, and I believe too many men try to do local anesthesia by simply studying the technical side, and such men do not understand the fundamental principles behind local anesthesia. The foundation upon which local anesthesia rests is the isotonic and hypertonic action on the derma. I have several times been asked to see some one operate under local anesthesia, the patient showing bad symptoms, with too much cocain in the Schleich solution. It was not too much cocain at all, but too much adrenalin. I believe the best way to succeed, and the one that

has given me most satisfaction, is to study the fundamental things in connection with local anesthetics, such as the physiology, the action of cocain and its derivatives, and the toxicology. That added to a thorough knowledge of nerve anatomy enables you to perform very nearly any operation under local that you can under general anesthesia if you take the time and patience to do it.

A STATISTICAL STUDY OF THREE THOUSAND CASES OF MENTAL DISEASES.*

By HENRY DASPIT, M. D., New Orleans.

CLASSIFICATION ACCORDING TO SEX, COLOR AND AGE.

WM	WF	CM	CF	Ttl
Under 10 years				
....	....	....	....	0
....	....	....	....	0
....	....	....	....	0
....	....	....	....	0
....	....	....	....	0
....	....	....	....	0
....	....	....	....	0
....	....	....	....	0
....	....	....	....	0
....	....	....	....	0
1	....	....	....	1
....	....	....	....	0
....	....	....	....	0
....	....	....	....	0
2	1	....	....	3
1	....	....	....	1
5	5	....	3	23
3	2	....	....	5
....	....	....	....	0
....	....	....	....	0
40 to 50				
1	....	....	....	1
....	....	....	....	0
5	3	6	....	14
103	15	52	18	188
2	1	1	....	4
1	....	....	....	1
....	....	....	....	0
27	4	3	3	37
1	1	....	....	2
1	1	1	1	4
3	4	1	2	10
13	20	6	15	54
2	18	1	13	34
8	13	1	....	22
17	18	4	....	39
8	4	5	4	21
....	....	....	....	0
29	11	1	2	43
3	9	10	2	24
1	2	1	....	4
7	1	2	1	11
66	9	8	4	87

WM	WF	CM	CF	Ttl
10 to 20				
1	....	....	....	1
....	....	....	....	0
....	....	....	....	0
....	....	....	....	0
....	....	....	....	0
....	....	....	....	0
....	....	....	....	0
....	....	1	....	1
1	....	....	....	1
....	....	1	....	1
2	5	1	6	14
4	1	....	4	9
....	....	....	....	0
26	7	16	6	55
....	....	....	....	0
4	8	5	3	20
1	5	....	....	6
23	9	7	6	45
20	10	9	6	45
1	....	2	1	4
20	15	5	4	44
1	1	....	....	2
50 to 60				
....	....	1	....	1
2	1	3	....	6
4	4	2	5	15
37	4	18	7	66
....	....	....	....	0
....	....	....	....	0
....	....	....	....	0
14	3	2	....	19
....	....	....	....	0
3	....	....	....	3
....	....	....	1	1
11	4	2	6	23
12	28	3	7	50
1	2	2	....	5
8	9	3	2	22
1	1	....	1	3
....	....	....	....	0
12	3	....	....	15
1	2	1	1	5
4	3	3	2	12
....	....	1	....	1
30	3	3	1	37

WM	WF	CM	CF	Ttl
20 to 30				
2	....	3	1	6
....	....	....	....	0
....	....	....	....	0
17	5	9	5	36
9	2	4	1	16
....	....	....	....	0
1	....	1	....	2
19	1	5	4	29
5	3	....	1	9
1	....	1	1	3
....	3	2	4	9
22	23	7	44	96
....	....	....	....	0
89	22	35	30	176
11	....	2	2	15
28	7	23	6	64
1	4	....	2	7
42	16	6	6	72
38	25	24	10	97
19	12	5	3	39
31	27	4	2	64
46	6	9	3	64
60 to 70				
....	....	....	....	0
40	38	35	50	163
6	2	5	1	14
7	1	2	1	11
....	....	....	....	0
....	....	....	....	0
....	....	....	....	0
....	1	1	....	2
....	....	....	....	0
1	....	2	....	3
....	....	....	....	0
6	3	3	1	13
4	15	1	3	23
2	1	....	....	3
3	2	1	....	6
1	....	....	....	1
....	....	....	....	0
....	....	....	....	0
4	....	....	....	4
1	....	....	....	1
3	2	2	....	7
....	....	....	....	0
8	....	....	....	8

WM	WF	CM	CF	Ttl
30 to 40				
1	2	....	1	4
....	....	....	....	0
....	....	1	....	1
69	30	34	19	152
19	1	8	2	30
....	....	....	....	0
2	....	1	....	3
38	1	9	2	50
2	....	1	2	5
2	2	....	6	10
2	1	....	....	3
10	40	11	32	93
....	....	....	2	2
28	25	4	6	63
25	16	13	6	60
21	7	11	3	42
1	....	....	....	1
28	17	4	4	63
8	17	13	17	45
20	2	8	7	37
10	3	8	3	24
103	8	19	4	134
Over 70				
....	....	....	....	0
19	10	8	7	44
10	5	9	6	30
....	....	....	....	0
....	....	....	....	0
....	....	....	....	0
....	....	....	....	0
1	....	1	....	2
....	....	....	....	0
....	....	....	....	0
....	....	....	....	0
1	1	....	....	2
....	....	....	....	0
3	5	1	1	10
....	....	....	....	0
1	....	....	....	1
....	....	....	....	0
....	....	....	....	0
....	....	....	....	0
....	....	....	....	0
1	....	....	....	1

*Addendum to article under this title, published in the August number, and inadvertently omitted at the time.—Ed.

NEWS AND COMMENT.

THE LAW PROVIDES AMPLY FOR THE CONTROL OF NARCOTIC EXPORT AND IMPORTS according to the narcotic section of the Internal Revenue Bureau, which, after compiling figures obtained from the Department of Commerce, states that exports have decreased from more than 600,000 ounds to less than 80,000 during the past year, ending June 30, 1921. Imports have decreased from more than 600,000 pounds to less than 5,000. This large falling off in both exports and imports coincides with the going into effect in May, 1920, of the more drastic regulations governing the exportation and importation of narcotic drugs and preparations.

THE SHEPHERD-TOWNER BILL PASSED. The newspapers have announced the passage of the Shepherd-Towner Bill in spite of the great protest made by the medical profession as a whole. Although the medical profession of the country is in a better position to judge whether or not this measure was needed, their suggestions were apparently not heeded. The Bill provides for the state furnishing aid to expectant mothers and was passed almost unanimously.

RED CROSS NOTES. The National Red Cross Convention will be held in Columbus, Ohio, October 4 to 8 inclusive. Several thousand delegates and visitors from all parts of the world are expected to attend. A Historical Pageant of the Red Cross will be held as the crowning effort of the four-day program, in which the services of more than 3,500 participants are expected, including a chorus of 1,100 voices and 2,500 men, women and children, from all parts of the United States.

Sir David Henderson, Director General of the League of the Red Cross Societies since its founding, in the Spring of 1919, died in Geneva Switzerland, on August 17, at the age of 59 years. Sir David's directorship of the League has been marked by a steady expansion until today its member societies number 32, representing almost every country that has its Red Cross Society.

AMERICAN CHEMICAL SOCIETY held its fall meeting in New York on Setember 6 to 10, and was the largest meeting ever

held by the Society, as there were about 300 or 400 British and Canadian members of the Society of Chemical Industry who came down as guests of the A. C. S. after holding the meeting of their own Society in Canada. Besides, a further factor contributing to the success of the meeting, was the opening of the National Exposition of Chemical Industries, September 12, just after the close of the chemists conclave.

DEATH OF GABRIEL LIPMANN. The discoverer of the process of reproducing photographs of things in their natural colors, Professor Gabriel Lipmann, one of the most famous French physicists, died recently on board the steamship "France" during a return voyage to France from the United States and Canada. Prof. Lipmann had reached the age of 73 years. He was awarded the Nobel prize for physics in 1918.

AMERICAN SOCIETY FOR THE CONTROL OF CANCER announces a seven days' campaign to be designated "Cancer Week" and to extend from October 30 to November 5. The purpose of the movement is to reach as many persons as possible in the United States and Canada and to urge upon them the vital message of cancer control. The large publicity which has been given regarding the subject of cancer mortality has succeeded insofar as to stop the increase in the death rate from this disease, statistics showing that since 1916 it has remained practically stationary.

THE SHREVEPORT MEDICAL SOCIETY will meet October 4, when the following paper will be presented: "The Expert Medical Witness", by a member of the Shreveport Bar, with Drs. W. P. Butler and Louis Abramson to open the discussion.

THE AMERICAN PHARMACEUTICAL ASSOCIATION held its annual meeting in New Orleans September 6 to 9. Charles H. Packard, of Boston, president, will be succeeded by Samuel L. Hilton of Washington. An interesting meeting was held consisting of sections on history, commercial interests, practical pharmacy and dispensing and a women's section. Alumni luncheons, a night dance at the Grunewald Hotel Cave, and a ride on the Mississippi river formed a part of the entertainment program. Lucius L. Walton, of Williamsport, Pennsylvania, will head the National Boards of Pharmacy for the coming term.

THE MEDICAL SOCIETY OF VIRGINIA will meet at Lynchburg October 18 to 21. Titles for a number of interesting papers

have been sent in and the subject selected for general discussion is "Systemic Manifestations of Chronic Local Infections" which will be considered under the headings of general considerations, medical treatment and surgical treatment.

THE MISSISSIPPI VALLEY MEDICAL ASSOCIATION, meeting on October 13, 14, 15, at St. Louis, has issued its preliminary program. There will be two days of clinical presentations by leaders in the various specialties; one day of clinics, on the fifteenth, and they will be held, as per printed schedule obtainable at registration desk, at the various St. Louis Hospitals and Universities; clinical discussions and illustrated demonstrations of Borderline Medical Subjects, by a group of distinguished clinicians. Each number on the scientific program is to be an address instead of the usual paper.

PERSONALS: In a letter received by a New Orleans physician from the American Consul, Tampico, Mexico, we learn that one of the physicians in Tampico who attended the late Dr Gustave Mann states that he died of typhoid fever, after an illness of several weeks. It was not thought, however, that he had typhoid until a short time before his death, nor was his condition thought to be serious, so much so that Mrs. Mann and children were not in Tampico at the time of the doctor's death. His remains were interred in the cemetery at Tampico.

REMOVALS: Dr. H. A. Folse, from Charity Hospital, New Orleans, to the Hospital, Belize, British Honduras.

Dr. Shirley H. Betts, of Mooringsport, La., to El Paso, Texas, at Long's Sanitarium.

Dr. J. A. Storck, from No. 508 Medical Building to No. 503 Title Guarantee Building, New Orleans.

Dr. A. C. Gage from New Orleans to Truxillo Railroad County Hospital, Truxillo, Honduras.

Dr. Carl E. Granberry, from New Orleans to Gulfport, Mississippi, where he will be with the U. S. Public Health Hospital.

Dr. W. G. Milholland, from New Orleans to Fresno, California, with the Burnett Sanitarium Company.

Dr. Benjamin Manhoff, from Lake City, Florida, to No. 406 St. James Building, Jacksonville, Florida.

Dr. G. G. McKellar, from Plain Dealing to Couchwood, Louisiana.

DIED: On Thursday, September 1, Dr. William Martin Perkins, of New Orleans, at the age of 48 years. Dr. Perkins will be regretted by a host of friends whose deepest sympathy he has had for the past year, ever since his return from the War where he contracted the disease which terminated in his death. He was for many years connected with the Faculties of the Graduate and Under-graduate Schools of Medicine of Tulane University in the Department of Surgery.

On Monday, September 5, Dr. Edwin J. Graner, of New Orleans, aged 58 years. Dr. Graner's health had been failing for some time and the end was not unexpected. He will be remembered as former president of both the Louisiana State Medical Society and the Orleans Parish Medical Society.

On Saturday, September 10, Dr. Ivan F. Siekmann, aged 59 years. A resident of New Orleans and member of the Louisiana State and Orleans Parish Medical Societies.

MORTUARY REPORT OF NEW ORLEANS.

Computed from the Monthly Report of the Board of Health of the City of New Orleans, for August, 1921.

CAUSE.	White.	Colored.	Total
Typhoid Fever	3	2	5
Intermittent Fever (Malarial Cachexia)	1		1
Smallpox			
Measles			
Scarlet Fever			
Whooping Cough		3	3
Diphtheria and Croup			
Influenza	2		2
Cholera Nostras			
Pyemia and Septicemia	1	2	3
Tuberculosis	29	37	66
Cancer	25	5	30
Rheumatism and Gout	1	1	2
Diabetes	9	2	11
Alcoholism	1		1
Encephalitis and Meningitis	1	1	2
Locomotor Ataxia	2	1	3
Congestion, Hemorrhage and Softening of Brain	34	11	45
Paralysis	3	2	5
Convulsions of Infancy	1		1
Other Diseases of Infancy	18	16	34
Tetanus			
Other Nervous Diseases	3	1	4
Heart Diseases	58	37	95
Bronchitis	4		4
Pneumonia and Broncho-Pneumonia	17	12	29
Other Respiratory Diseases	1		1
Ulcer of Stomach			
Other Diseases of Stomach	2		2
Diarrhea, Dysentery and Enteritis	10	13	23
Hernia, Intestinal Obstruction		2	2
Cirrhosis of Liver	1	5	6
Other Diseases of the Liver	2	1	3
Simple Peritonitis			
Appendicitis	17	1	18
Bright's Disease	25	13	38
Other Genito-Urinary Diseases	13	12	25
Puerperal Diseases	4	6	10
Senile Debility	1		1
Suicide	2	2	4
Injuries	32	8	40
All Other Causes	28	19	47
Total	351	215	566

Still-born Children—White, 23; colored, 23; total, 46.

Population of City (estimated)—White, 290,000; colored, 110,000; total, 400,000.

Death Rate per 1000 per annum for Month—White, 14.52; colored, 23.45; total, 16.98; Non-residents excluded, 14.94.

METEOROLOGICAL SUMMARY (U. S. Weather Bureau).

Mean atmospheric pressure 30.05

Mean temperature 84

Total precipitation ..... 3.09 inches

Prevailing direction of wind, southwest.